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CONTENTS

Book Review

CONCISE TEXTBOOK OF HISTOLOGY FOR UNDERGRADUATE STUDENTS

Dr. Sonia Jaiswal, Prof. P.K. Sharma
Department of Anatomy, Era's Lucknow Medical College, Era's University, Lucknow, UP, India

Concise Textbook of Histology for Undergraduate Students, authored by Sangeeta M, Varalakshmi KL and Jyothi N Nayak, published by Thieme Medical and Scientific Publishers Private limited. The book was first reprinted in 2018 and next in 2019. The ISBN number is 978-93-86293-74-9.

Prof. Sangeeta M is the head of the department, Department of Anatomy, MVJ Medical College, Bangalore. She has numerous publications to her credit with more than 14 years of teaching experience. Dr Varalakshmi KL has authored several publications and has a brilliant academic record. The author Jyothi N Nayak has 6 years of teaching experience and is an active researcher.

The book is written from the perspective of an undergraduate student. The language of the book has been kept simple and is thus easy to understand. The hand drawn diagrams are easy to replicate hence undergraduate students can easily correlate with the images from various slides. There are points of identification and questions given at the end of each chapter which help in a better understanding of the text. I have reviewed the book as follows-

Chapter 1: Microscope

The chapter on the microscope is concise and to the point. The diagrammatic representation of the microscope is well made and easy to reproduce keeping in mind the undergraduate students. The components of the microscope are properly outlined. The definition of magnification with a difference between resolution and magnification could have been included in the chapter. The function of 40X magnification on page 2 lacks clarity.

Chapter 2: Tissue Preparation

The steps of tissue preparation are properly outlined with an excellent flowchart depicting the steps in staining but the term bluing should be explained. The points on tissue collection are correct however the second point on tissue being usually collected from the mouse gives an impression that histology is studied usually in mice only. The instrument used for cutting tissues is not mentioned, simply stating that the tissue is cut by a knife does not solve the purpose. A knife can also give the impression of a kitchen knife. An example of a fixative could have been included in the second point.

Chapter 3: Epithelium

The chapter has covered the learning objectives to a large extent, an incorporation of a flowchart showing the classification could have been included. The chapter has plenty of editing flaws such as arrows in figure 3.2 point towards the alveoli of the lung instead of the epithelium. Fig 3.3 and 3.4 showing cuboidal epithelium is under the heading of simple columnar epithelium. Fig 3.5 and 3.6 should come under the heading of simple columnar epithelium. Similar glitches are seen with figure 3.7-3.11.

Figure numbers 3.1, 3.3, 3.5, 3.7, 3.13, 3.14, 3.18, 3.19, 3.21, 3.23 and 3.24 are not labelled. In fig. 3.15 the arrow points towards a space rather than stratified columnar epithelium.

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Chapter 4: Glands

The chapter is concise and to the point. A flowchart showing the classification of glands could have been included in the chapter. The definition of tubule-alveolar glands lacks clarity and gives the impression of an incomplete sentence. Unicellular glands have not found a place in this chapter.

Chapter 5: Connective Tissue

Illustrations in the chapter are of good quality. The chapter includes all important features that are taught to undergraduate students.

Chapter 6: Cartilage

The chapter on cartilage is well written including points of identification which is beneficial for students. Fig 6.1, 6.3, and 6.5 are well drawn diagrams with a proper labelling.

Chapter 7: Bone

The chapter covers all the important points related to the microscopic anatomy of bone. Fig 7.2, 7.3, 7.4 and 7.5 show a schematic representation of various cells present in the bone. Fig 7.9 and 7.11illustrate the transverse and longitudinal section of the bone under a low magnification but do not mention the names of the stains used.

Chapter 8: Muscles

The diagrammatic representations shown in fig 8.1, 8.5, 8.6 and 8.7 are very well illustrated especially fig 8.5 which shows the H band and Z line. An excellent flowchart showing the steps of muscle contraction has been incorporated in the chapter. Fig 8.9 shows the components of the intercalated disc and is well illustrated. Table 8.1 neatly summarises a comparative account of all three muscle types.

Chapter 9: Nervous Tissue

The chapter on nervous tissue is well written. Fig 9.2-9.10 are well illustrated.

Chapter 10: Circulatory System

The chapter covers all the important aspects and justifies the learning objectives meant for an undergraduate student.

Chapter 11: Lymphatic Tissue

The figures in this chapter are very well illustrated. It is very easy to correlate the H&E pencil drawing with the slides stained with haematoxylin and eosin stain and focussed under low magnification.

Chapters: 12-23

The text in these chapters is precise and to the point. The diagrams are well drawn and labelled and are in congruity with the images of various slides.

The authors have done a commendable job in penning down this book. With a few simple moderations the book in times to come will be an excellent guide to comprehend the complexities of cellular morphology.

Original Article

SONOGRAPHIC EVALUATION OF SCIATICNERVE ANATOMY AND SUBCUTANEOUS DEPTH AT ITS TERMINATION IN POSTERIOR THIGH: IMPORTANCE IN POPLITEAL BLOCKS

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ABSTRACT

Introduction: Sciatic nerve (SN) is about 2cm wide, forms in the pelvis from ventral rami of L4-S3 spinal nerves and leaves the pelvis by passing out via greater sciatic foramen inferior to piriformis. It travels in the posterior compartment of thigh where it is crossed by long head of biceps femoris, and terminates by dividing into tibial and common peroneal nerves proximal to knee near the apex of popliteal fossa. Cross sectional area (CSA) of SN at mid-thigh and the level of termination may vary. This is important in respect to clinical as well as treatment purpose for the performance of popliteal block. Popliteal nerve block is the block of SN in the popliteal fossa, it is ideal for surgeries of lower leg, particularly below the knee, foot and ankle. It anesthetizes the same dermatomes as both the anterior and lateral approaches to the SN. Variability in level of termination and subcutaneous depth may account for the frequent failures associated with popliteal block. Ultrasound guided sciatic nerve blockade when performed in a systematic manner, is associated with a high success rate.

Aims & Objectives: Present study was done to evaluate sciatic nerve morphometry and its depth from skin with the help of high resolution ultrasonography (HRUS) and highlight importance of relevant anatomy in relation to popliteal nerve block.

Material & Methods: Study was conducted in the Department of Anatomy, King George's Medical University, Lucknow, Uttar Pradesh, India in 50 volunteer students of 1st year MBBS 2018 batch (25 males & 25 females). Sonography was done with the help of Esaote Europe My Lab 40 ultrasound machine (installed in the Department of Anatomy, KGMU) to observe Cross sectional area, perimeter, level of termination of nerve and its depth from skin at a particular site.

Results: CSA ranged from 0.22-0.35±0.028cm^2 and perimeter ranged from 15.23 – 30.33±2.92 mm. The mean CSA of SN was equal on both sides ie. 0.27± 0.028 cm^2 on right and 0.27±-0.025 cm^2 on left. The perimeter of SN on right side was 21.27±2.92 mm and left side 20.29±2.05 mm. The depth of SN from skin on right side was 19.16±1.70 mm while on left side 19.16±1.70mm. The level of termination was 77.65±4.31 mm on right side while 77.26±4.43 mm on left side proximal to popliteal crease.Rt. SN mean CSA was almost equal among males and females whereas Lt. SN mean CSA was found to be significantly (p-value-0.048) greater in males as compared to females. The perimeter of nerve had significantly (0.043) larger values on both right and left side in females as compared to males. The depth of SN from skin was slightly more in males as compared to females while level of termination was bilaterally almost similar in both males and females.

Conclusion: Normal values of various parameters of sciatic nerve evaluated in our study will be helpful in guiding and facilitating popliteal block in various surgeries.

Keywords: Ultrasonography, sciatic nerve, popliteal nerve block

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INTRODUCTION

Sciatic nerve (SN) is a branch of lumbo-sacral plexus, it is the thickest nerve in the body and is about 2cm wide [1]. It originates from the ventral rami of L4-S3 roots in the form of two nerve trunks the tibial nerve (TN) and the common peroneal nerve (CPN) that course within a single epineural sheath. Its course corresponds to a line drawn from just medial to the midpoint between the ischial tuberosity and greater trochanter to the apex of the popliteal fossa (at the junction of middle and lower third of the thigh where the TN and CPN finally separate [2]. In the popliteal fossa, sciatic nerve is bordered superolaterally by long head of biceps femoris and superomedially by semimembranosus (SMM) and semitendinosus (STM) muscles.

Measurement of cross-sectional area (CSA) of the nerve is the most widely accepted and reliable method for the diagnosis of nerve disorders. Thus, determination of reference value of CSA is crucial to identification of nerve pathology and proper diagnosis [3-6]. The studies have shown that the level of bifurcation of SN can be above or below the normally described level [7-9]. The knowledge of level of termination is important from clinical as well as treatment purpose. Sciatic nerve block is given in the popliteal fossa and is ideal for surgeries of lower leg, particularly below the knee, foot and ankle [10,11]. It anesthetizes the same dermatomes as both the anterior and lateral approaches to the SN [12-15]. It preserves the hamstring function and allows easier ambulation of post-operative patients. The insertion of the needle at 100 mm above the popliteal crease ensures placement of the needle in the vicinity of or proximal to the division of the SN [16]. The SN divided at a mean distance of 60.5 ±27.0 mm (range 0 to 115 mm) above the popliteal fossa crease [16]. Previously frequent failures of popliteal nerve block were noted during blind procedures due to variable levels of termination. Ultrasound guided Sciatic nerve blockade can be done at different levels along the posterior aspect of thigh via gluteal, subgluteal and popliteal approach. It is routinely done for surgery and pain management of lower extremity and is a commonly used technique in clinical practice. When performed in a systematic manner, it is associated with a high success rate [17,18].

High resolution ultrasonography (HRUS) has become a preferred technique for peripheral nerve imaging, it allows visualization of nerve caliber, continuity, echogenicity, echotexture, and is also able to identify tumours, traumatic lesions, entrapments with nerve damage, inflammation, demyelinating features or infections. Nerve blocks, biopsies or therapeutic application of drugs like procedures can be easily done by ultrasound guided interventions. Popliteal fossa is a preferred site for catheter insertion for post-operative analgesia. For the surgery on foot and ankle popliteal block is preferred over the gluteal and subgluteal approach as there is no hamstring weakness with this block. Anatomical variations of sciatic nerve termination have been suspected as a possible cause for incomplete block of the SN in the popliteal fossa [19-21]. We conducted a sonographic study to observe the morphometry (CSA and perimeter), level of termination and depth of SN from the skin, to create a nomogram that will help in avoiding the pitfalls in the diagnosis of nerve pathologies as well as help the anaesthesiologists in giving sciatic nerve block.

The aim of the study was anatomical evaluation of right and left sciatic nerves in posterior thigh and to observe its depth from skin by ultrasonography. Parameters of sciatic nerve observed in the distal thigh included cross-sectional area (CSA), perimeter, level of termination (LOT) and depth from skin (DFS).

MATERIAL AND METHODS

The study included 50 volunteers from 1st year MBBS 2018 batch (25 male & 25 female students). Ultrasonography was done using Esaote Europe My Lab 40 ultrasound machine (installed in the Department of Anatomy, King George's Medical University, UP) with linear probe of frequency 6-13 MHz.

Subjects were made to lie in a prone position with leg extended and a pillow was placed under the ankle to support the leg. The popliteal crease was identified and a line was marked proximal to popliteal crease. Skin and transducer preparation was done and the sciatic nerve was identified at this level and traced distally upto the level of termination (Fig. 1).

The nerve was identified on the basis of characteristic echopattern, described as, "honeycomb shaped" because of dark punctuate areas (fascicle groups) surrounded by hyperechoic band (perineurium). In the longitudinal plane, it was seen as a long, slim structure with parallel hypoechoic and hyperechoic lines [22].

The cross sectional area, perimeter, depth from skin were assessed at the level of termination and distance of the sciatic nerve termination to the popliteal fossa crease was measured and recorded. At each site where depth of nerve from skin surface was measured by tracing the hyperechoic rim, care was taken to ensure that the transducer was perpendicular to nerve (Fig. 2). All the readings were recorded by single observer carefully and were compared on the left and right side.

Fig. 1: Showing position of sonographic linear probe at termination of sciatic nerve proximal to popliteal crease

Fig. 2: Showing left sciatic nerve anatomy proximal to the popliteal crease

OBSERVATIONS AND RESULTS

Sonographic measurements from 50 subjects (25 males and 25 females) were evaluated and the results were recorded. Overall CSA of Sciatic nerve ranged from 0.22 - 0.35 cm^2 and overall perimeter ranged from 15.25 – 30.25 mm. The mean CSA of Rt. SN was 0.27± 0.028 cm^2 and Lt. SN was 0.27±-0.025 cm^2. The mean CSA was equal on both right and left sides (Rt=Lt). Rt. SN mean CSA was almost equal among males (0.27± 0.019 cm^2) and females (0.27± 0.035 cm^2) whereas Lt. SN mean CSA was fond to be significantly (p-value-0.048) greater in males (0.28± 0.162 cm^2) as compared to females (0.27± 0.025 cm^2).

The perimeter of Rt. SN was 21.27±2.92 mm and Lt SN was 20.29±2.05 mm. The perimeter of SN in females had significantly larger values (p value-0.043) on both sides (Rt SN-21.67±3.78mm; Lt SN-20.88±2.22mm) as compared to males (Rt SN-20.88±1.67mm and Lt SN 19.70±1.72mm) (Table 1).

Table 1: Mean cross-sectional area (cm^2) and perimeter (mm) of sciatic nerve just proximal to its termination (Right and Left lower limbs=100)

Group		Rt. SN		Lt. SN	
		CSA (cm^2)	Perimeter (mm)	CSA (cm^2)	Perimeter (mm)
Males (25)	Min.	0.24	18.32	0.26	16.25
	Max.	0.32	25.06	0.33	23.7
	Mean	0.27	20.88	0.28	19.70
	SD	0.019	1.67	0.162	1.72
Females (25)	Min.	0.22	15.25	0.22	18.19
	Max.	0.35	30.25	0.33	27.22
	Mean	0.27	21.67	0.27	20.88
	SD	0.035	3.78	0.025	2.22
Total(50)	Min.	0.22	15.25	0.22	16.25
	Max.	0.35	30.25	0.33	27.22
	Mean	0.27	21.27	0.27	20.29
	SD	0.028	2.92	0.025	2.05

(CSA-cross sectional area, Rt. SN-right sciatic nerve, Lt. SN-left sciatic nerve)

Level of termination in respect to popliteal crease ranged from 70.1- 88.6 mm and depth under the skin ranged from 15.30–23.50 mm. Level of termination of Rt. SN was 77.48±4.26 mm proximal to popliteal crease in males whereas it terminated 77.81±4.44 mm proximal to popliteal crease in females. Left sciatic nerve terminated at a distance of 77.18±4.41mm and 77.03±4.53 mm from popliteal crease in males and females respectively. The level of termination of SN on right side was 77.65±4.31 mm was insignificant and slightly more proximal as compared to Lt. SN 77.26±4.43 mm.

Average depth of right sciatic nerve was 19.71±1.21mm in males and 19.18±1.41 mm in

females (M≥F) whereas left sciatic nerve was 19.61±1.80 mm deep in males and 18.71±1.50 mm in females (M>F).The depth of SN from skin on right side was 19.16±1.70 mm while on left side 19.16±1.70mm (Rt=Lt). The depth of SN from skin was slightly more in males as compared to females while level of termination of SN almost equal in both male and females (Table 2, Fig. 3).

Table 2: Level of termination and depth from skin at its termination (Right and Left lower limbs=100)

Group		Rt. SN		Lt. SN	
		LOT (mm)	DFS (mm)	LOT (mm)	DFS (mm)
Males (25)	Min.	70.5	18.2	70.8	15.5
	Max.	88.6	22.5	88.5	23.5
	Mean	77.48	19.71	77.18	19.61
	SD	4.26	1.21	4.41	1.80
Females (25)	Min.	70.1	16.7	70.2	15.3
	Max.	87.6	23.8	88.5	21.5
	Mean	77.81	19.18	77.03	18.71
	SD	4.44	1.41	4.53	1.50
Total(50)	Min.	70.1	15.3	70.2	15.3
	Max.	88.6	23.5	88.5	23.5
	Mean	77.65	19.16	77.26	19.16
	SD	4.31	1.70	4.43	1.70

(SN-Sciatic Nerve, LOT-Level of termination of sciatic nerve, DFS-Depth of nerve from skin)

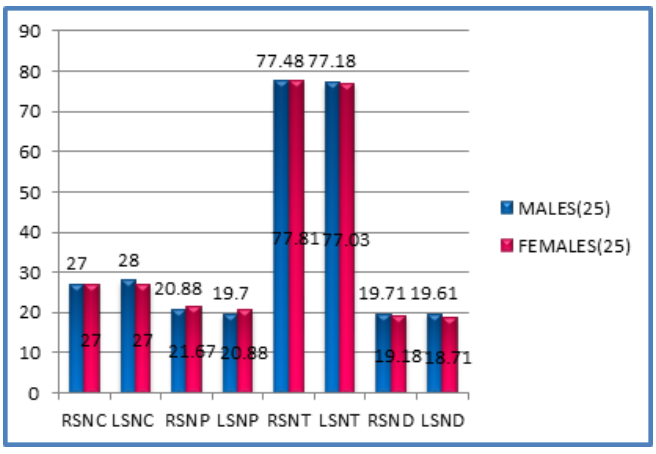

Fig. 3: Bar diagram showing Genderwise comparison of CSA, Perimeter, DFS and LOT of sciatic nerve

DISCUSSION

Ultrasonographic findings of sciatic nerves revealed mean CSA ranging from 0.22 - 0.35 cm^2 which was similar to values reported by Cartwright et al. (2008) [3], Lo et al. (2007) [23], Tagliafico et al. (2012) [24], Seok et al. (2014) [5] and Kim et al. (2016) [25], but less than the findings reported by Latzke et al. (2009) [26] and Jun Chen et al. (2018) [27]. In present study, CSA did not differ by laterality and we found no significant side-to-side differences between right and left side nerves which was similar to study done by Tagliafico et al. (2012) [24]. In present study, females had smaller CSAs of the normal sciatic nerves than men which was similar to the observation of Jun Chen et al. (2018) [27].

Perimeter of sciatic nerve in our study ranged between 15.23 – 30.33 mm. The mean perimeter was greater on right side in comparison to left. The perimeter of SN was found to be significantly larger in females in comparison to males. The perimeter observed in the present study was less than that reported by Latzke et al. (2009) [26], as they did'nt mentioned any correlation of laterality and gender with perimeter in their studies.

The overall mean level of termination of sciatic nerve ranged from 70.1- 88.6 mm; it was similar to the findings observed by Singelyn et al. (1991) [28], Volka et al. (2001) [16] and Silverman et al. (2017) [29]. Level of termination reported in our study was greater than the findings reported by Sinha et al. (2014) [8]. In present study, mean of level of termination of sciatic nerve on right side was found to be slightly, but insignificantly, more proximal to popliteal crease than on left side. According to the previous studies, distances did not differ by laterality as reported by Singelyn et al., (1991) [28] and Volka et al. (2001) [16]. In present study overall level of termination was equal in both males and females, no gender based difference in the level of termination was also reported by Volka et al. (2001) [16] and Singelyn et al. (1991) [28].

Mean depth of sciatic nerve from skin ranged from 15.30–23.50 mm. Our range of subcutaneous depth is less as compared to findings observed by Osaka et al. (2011) [30], who found the distance of nerve from skin was 3.0–5.5 cm, also Munirama et al. (2013) [31] who found it to be 4.0 cm and Tedesco et al. (2019) [32] who reported it as 4-6 cm deep from skin**.** Vincent et al. (2006) [33] observed 15 subjects and code the mean of sciatic nerve depth from skin was 3.48 ± 0.91 cm. Latzke et al. (2009) [26] conducted his study

on 20 subjects and noted the mean reference value 28.3 (17.2-37.1mm) which coincides with present study.

In present study, we found that the values of CSA and perimeter obtained from HRUS of both right and left limb showed similarity. Hence either of the nerves at this site could be used as control while comparing from the other side for any evaluation as a part of diagnosis or follow up. The overall level of termination was equal in both males and females. Depth of nerve from skin was bilaterally less in females than males in both sides.

The clinical importance of peripheral regional anaesthesia is rapidly growing. Today, peripheral nerve blocks managed a large spectrum of surgical and pain-related cases. Success rates and safety measures in daily clinical practices are the most important prerequisites for the use of peripheral regional anaesthesia. These are closely related to the administered volumes of local anaesthetics. Direct ultrasonographic visualization of nerve structures enables the performance of blocks with reduced volumes of local anaesthetics [34]. In an early attempt, our study group showed that the ultrasound guided measurement of various parameters of nerves may be useful in nerve block for different surgical procedures.

CONCLUSION

Knowledge of anatomical variations of the SN is of importance in orthopedics, anaesthesia and surgery. Variant anatomy of the sciatic nerve may influence the posterior hip operation. High division may develop in sciatica, resulting in nerve injury during deep intramuscular injections in gluteal region, piriformis syndrome, failed SN block in anesthesia and injury. Interpretation of sciatic neuropathy can be complicated by variation in division of SN. The knowledge of variations in the course and level of division of SN serves anesthetist during popliteal sciatic block to improve clinical results. Hence, nerve imaging and extra operative alertness are suggested during different surgical procedures of the popliteal regions.

REFERENCES

1. Prakash KD, Amanrao BP, Karan K, Santosh S. Study of anatomical variations of the sciatic nerve and its importance to clinicians and anesthetist. Int J Curr Res. 2014; 6 (7):7518-21.
2. Standring S. Gray's Anatomy. 39th ed. Churchill Livingstone: Elsevier. 2004; 857 – 932.
3. Cartwright MS, Passmore LV, Yoon JS et al. Cross-sectional area reference values for nerve ultrasonography. Muscle Nerve. 2008; 37:566–571.
4. Bargfrede M, Schwennicke A, Tumani H, Reimers CD. Quantitative ultrasonography in focal neuropathies as compared to clinical and EMG findings. Eur J Ultrasound. 1999; 10:21–29.
5. Seok HY, Jang JH, Won SJ, Yoon JS, Park KS, Kim BJ. Cross-sectional area reference values of nerves in the lower extremities using ultrasonography. Muscle Nerve. 2014; 50:564–570.
6. Visser LH, Hens V, Soethout M, De Deugd-Maria V, Pijnenburg J, Brekelmans GJ. Diagnostic value of high-resolution sonography in common fibular neuropathy at the fibular head. Muscle Nerve. 2013; 48:171–178.
7. Bangarayya, Naik V, Pillai TJ. The Study of Sciatic Nerve Based on Its Morphometric Measurements And It's Variations. IOSR-JDMS. 2012; 17(3):56-62.
8. Sinha MB, Gupta R, Aggarwal A, Sinha HP. Anatomy of sciatic nerve bifurcation in popliteal fossa: a fetal study. J. Morpho. Sci. 2014; 31:199-201.
9. Patel Z, Gupta S, Chavda H, Jethava N. Cadaveric study of variations in divisions of sciatic nerve. International Journal of Anatomy, Radiology and Surgery. 2017; 6(2): AO15-AO19.
10. Rongstad K, Mann RA, Prieskom D, Nichelson S, Horton G. Popliteal sciatic nerve block for postoperative analgesia. Foot Ankle Int. 1996; 17:378-382.
11. Admir H, Jerry DV. A comparison of the posterior versus lateral approaches to the block of the sciatic nerve in the popliteal fossa. Anesthesiology 1988; 88(6):1480-1486.
12. Rorie DK, Byer DE, Nelson DO et al. – Assessment of block of the sciatic nerve in the popliteal fossa. Anesth Analg, 1980; 59:371-376.
13. Volka D, Hadzic A, Kitain E et al. Anatomic considerations for sciatic nerve block in the popliteal fossa through the lateral approach. Reg Anesth, 1996; 21:414-418.
14. Marhofer P, Greher M, Kapral S. Ultrasound guidance in regional anesthesia. Br J Anesth. 2005; 94:7-17.
15. Sinha A, Chan VWS. Ultrasound imaging for popliteal sciatic nerve block. Reg Anesth Pain Med. 2004; 29:130-134.
16. Volka JD, Hadzic A, Kitain E, Lesser JB, Kuroda MM, April EW, Thys DM. Supine approach to the sciatic nerve in the popliteal fossa. Can J Anaesth. 1996; 43(9):964-967.
17. Bruelle P, Muller L, Bassoul B, Eledjam JJ. Block of sciatic nerve. Cah Anesthesiol. 1994; 42(6):785-791.
18. Dalens B, Tanguy A, Vanneuville G. Sciatic nerve blocks in children: comparison of the posterior, anterior and lateral approaches in 180 pediatric patients. Anesth Analg. 1990;70:131-137.
19. Sunderland S, ed. The sciatic nerve and its tibial and common peroneal divisions: anatomical and physiological features. In:

Nerves and nerve injuries. New York: Churchill Livingstone, 1978:925– 66.

20. Benzon HT, Kim C, Benzon HP et al. Correlation between evoked motor response of the sciatic nerve and sensory blockade. Anesthesiology 1997; 87:548 –52.

21. Hadžić A, Volka JD, Kitain E et al. Division of the sciatic nerve and its possible implications in popliteal nerve blockade [abstract]. Anesthesiology 1996; 85:A733.

22. Silvestri E, Martinoli C, Derchi LE, Bertolotto M, Chiaramondia M, Rosenberg I. Echotexture of peripheral nerves: correlation between US and histologic findings and criteria to differentiate tendons. Radiology. 1995; 197(1):291–296.

23. Lo YL, Fook-Chong S, Leoh TH, Dan YF, Tan YE, Lau WH et al. High-resolution ultrasound as a diagnostic adjunct in common peroneal neuropathy. Arch Neurol 2007; 64:1798–1800.

24. Tagliafico A, Cadoni A, Fisci E, Bignotti B, Padua L, Martinoli C. Reliability of side-to-side ultrasound cross-sectional area measurements of lower extremity nerves in healthy subjects. Muscle Nerve. 2012; 46:717–722.

25. Ji Yeon Kim, Seojin Song, Hye Jung Park, Won Ihl Rhee, Diagnostic cut-off value for ultrasonography of the common fibular neuropathy at the fibular head. Ann Rehabil Med. 2016; 40(6): 1057–1063.

26. Ju Chen J, Liu J, Zeng J, Wu S, Ren J. Ultrasonographic reference values for assessing normal sciatic nerve ultrasonography in the normal population. J Med Ultrasound. 2018; 26:85-9.

27. Latzke D, Marhofer P, Zeitlinger M. Minimal local anaesthetic volumes for sciatic nerve block: evaluation of ED_{99} in volunteers. *British Journal of Anaesthesia*. 2010; 104:239–244.

28. Singelyn FJ, Gouverneur JM, Gribomont BF. Popliteal sciatic nerve block aided by a nerve stimulator: a reliable technique for foot and ankle surgery. Reg Anesth. 1991; 16:278 – 81.

29. Silverman ER, Vydyanathan A, Gritsenko K et al. The anatomic relationship of the tibial nerve to the common peroneal nerve in the popliteal fossa: Implications for selective tibial nerve block in total knee arthroplasty. Pain Research and Management. 2017; 7250181, (6).

30. Osaka Y, Nagatsuka Y et al. Ultrasound-guided medial mid-thigh approach to sciatic nerve block with a patient in a supine position. J Anesth. 2011; 25(4): 621–624.

31. Munirama S, McLeod G et al. Ultrasound-guided femoral and sciatic nerve blocks. *Anaesthesia Critical Care & Pain.* 2013; 4 (13):136–140.

32. Tedesco M1, Sepolvere G2, Cibelli M. Ultrasound-guided lateral, mid-shaft approach for proximal sciatic nerve block. Reg Anesth Pain Med. 2019; 10070.

33. Vincent W, Hugo Nova, Sherif Abbas et al. Ultrasound Examination and Localization of the Sciatic Nerve Anesthesiology 2006; 104:309-14.

34. Oberndorfer U, Marhofer P, Bosenberg A et al. Ultrasonographic guidance for sciatic and femoral nerve blocks in children. B JA. 2007; 98: 797-801.

Original Article

HISTOLOGICAL EFFECTS OF FORMALDEHYDE INHALATION ON THE ALVEOLAR ARCHITECTURE OF LUNGS OF ALBINO RATS

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ABSTRACT

Introduction: Formaldehyde is a flammable, colourless, reactive, readily polymerized gas at normal room temperature and pressure. Formaldehyde vapour is readily absorbed from the lungs. Formaldehyde is combined with methanol and buffers to make embalming fluid. In the dissection hall, during embalming or cadaveric dissection and histo-pathological preservation, medical professionals are exposed to formaldehyde vapours.

Respiratory system is the major target of formaldehyde. So, the present study aims to assess the histological changes on the architecture of alveoli of albino rats after inhalation of formaldehyde vapours.

Material & Methods: 24 albino rats were exposed to formaldehyde vapours for 28 days. They were exposed with various concentrations and thus 4 groups, having 6 rats in each, were made. They were sacrificed and the lung tissue was taken and studied by using H & E stain.

Results: The study shows a number of important histological changes which are concentration dependent.

Conclusion: It may be concluded from the present study that concentration of formaldehyde can affect significantly on the histopathology of the lungs of albino rats.

Keywords: Formaldehyde exposure, lung alveoli architecture, histo-pathological changes.

INTRODUCTION

Formaldehyde is the simplest aldehyde which is a flammable, colourless, reactive, readily polymerized gas at normal room temperature and pressure, with a relative molecular mass of 30.03 and a pungent odour [1]. Formaldehyde concentration is generally explained as parts per million (ppm; 1 ppm¼ 1.25 mg/m^3). It is a strong-smelling gas which is often found in aqueous solutions called formalin solution, with a maximum concentration of 37% by weight (40% by volume). Formalin solutions often contain some amount of methanol (10 -15% v/v) as a stabilizer to prevent polymerization of formaldehyde. Fixative solutions labelled as 10% buffered formalin are actually 4% solutions of formaldehyde (a 10% solution made from a 37- 40% solution of formaldehyde) [2]. Considerable human exposure to formaldehyde gas occurs at concentrations up to 1 ppm [3].

In the dissection lab, during embalming, cadaveric dissection and histo-pathological preservation, medical professionals are exposed to formaldehyde vapours.

Formaldehyde is readily absorbed from the respiratory tract, from the gastrointestinal tract after ingestion and gives serious systemic effects. It gives

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local effects by ocular absorption of vapours like irritation, burning sensations and lacrimation. It is poorly absorbed following dermal exposure [4]. The commonest route of exposure of formaldehyde is by inhalation and even fairly low concentrations of formaldehyde can produce rapid onset of nose and throat irritation, causing cough, chest pain, shortness of breath, and wheezing. Higher exposures can cause significant inflammation of the lower respiratory tract which can lead to haemorrhagic to fibrotic changes [5].

Respiratory system is the major target of formaldehyde. So, the present study was undertaken to assess the histological changes on the architecture of alveoli of albino rats after inhalation of formaldehyde vapours at different concentration.

MATERIAL AND METHODS

The present study was conducted after obtaining approval from the Institutional Ethical Committee. 24 albino rats of both sexes, weighing approximately 150-200 grams were used in the experiment. The rats were housed in a well-lighted and ventilated room. Under controlled condition, they were acclimatized for 3 weeks before the experiment. Fifty grams of food in the form of pellets per day and water *ad libitum* was given to the rats.

The study comprised of 4 groups of albino rats. Group I was not exposed with formaldehyde and taken as Control, Group II was exposed at 4%, Group III at 8% and Group IV was exposed at 40% formaldehyde solution till 28 days.

For exposure, 40 ml of formaldehyde solution was kept in a petridish in the cage for 4 hours per day, 6 days a week. After the experiment was over for a particular group, the rats were taken, weighed, anaesthetized, and then dissected. The thoracic cage was opened and the lungs were taken out and preserved. After fixation, dehydration, clearing, wax impregnation and embedding was done. Then ribbon sections were made and staining procedure was done with Hematoxylin and Eosin stain. Further the slides were observed under microscope for histological study.

OBSERVATIONS AND RESULTS

In the present study remarkable increase in histopathological changes in lungs of albino rats were observed as compared to control group. The Hematoxylin and Eosin stained sections of lungs of control rats showed no obvious histopathological changes (Fig. 1).

Among the experimental rats, the findings are detailed with their presence as the number of rats among 6 rats of particular group (Table 1, Fig. 2-11).

Table 1: Number of rats in each group in which particular histological finding is present

S.No.	(At 28 days of exposure) GROUPS→	I (C) 6rats	II (4%) 6 rats	III (8%) 6 rats	IV (40%) 6 rats
	FINDINGS↓				
1	Alveolar wall thickness	0	6	6	6
2	Alveolar space narrowing	0	6	6	6
3	Alveolar wall disruption	0	6	6	6
4	Emphysema	0	3	3	4
5	Distorted interstitial architecture	0	6	6	6
6	Alveolar edema	0	6	6	6
7	Alveolar hemorrhage	0	6	6	6
8	Dilatation and congestion of blood vessels	0	6	6	6
9	Pulmonary vasculitis	0	3	4	4
10	Thickening of blood vessel wall	0	4	4	5
11	Inflammatory infiltrates	0	6	6	6
12	Lymphoid tissue Hyperplasia	0	5	6	6
13	Fatty infiltrates in pulmonary interestitium	0	3	4	4
14	Pulmonary fibrosis	0	3	3	4

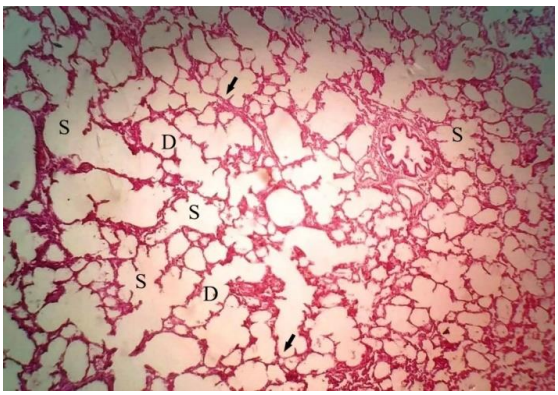

Fig.1: A photomicrograph of lung of control albino rat after 28 weeks of experiment. H&E X 40. Showing alveolar ducts (D), alveolar sacs (S), alveoli (arrow heads), pulmonary vessels

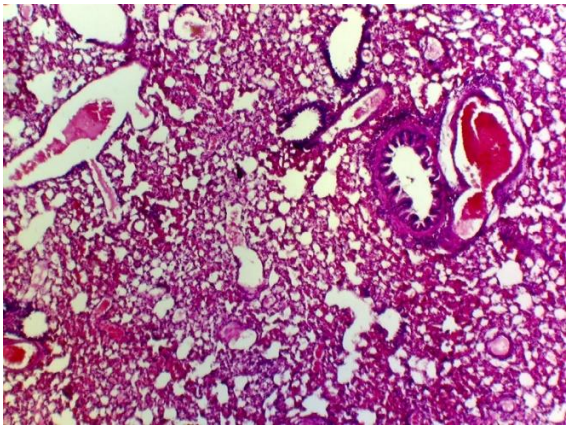

Fig. 2: A photomicrograph of lung of albino rat (4 weeks exposure of 4% formaldehyde). H&E X 100. Showing alveolar wall thickness, alveolar space narrowing, distorted interstitial architecture, alveolar edema and heamorrhage, dilatation and congestion of blood vessels

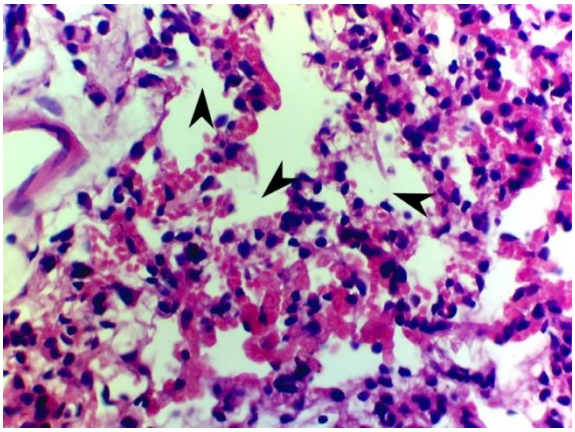

Fig. 3: A photomicrograph of lung of albino rat (4 weeks of exposure of 8% formaldehyde. H&E X 400. Showing Alv. wall thickness, Alv. space narrowing, Alv. wall disruption (Arrow heads), Alv heamorrhage, distorted interstitial architecture, inflammatory infiltrates

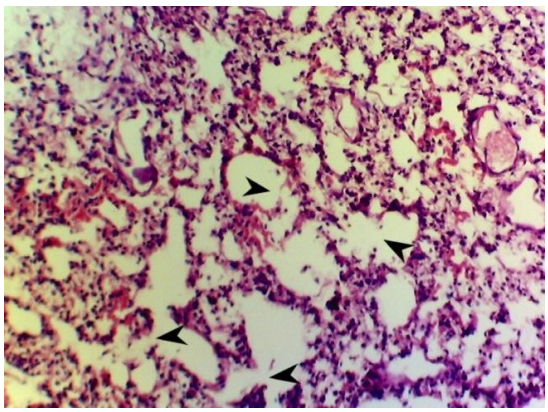

Fig. 4: A photomicrograph of lung of albino rat (4 weeks of exposure of 8% formaldehyde). H&E X 100. Showing Alv wall thickness, Alv space narrowing, Alv wall disruption (Arrow heads), Alv heamorrhage, distorted interstitial architecture

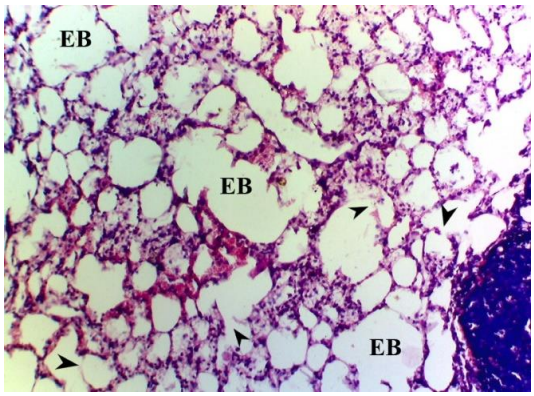

Fig. 5: A photomicrograph of lung of albino rat (4 weeks of exposure of 40% formaldehyde). H&E X 100. Showing alveolar wall thickness, Alv. space narrowing, Alv. wall disruption (Arrow heads), emphysematous bullae (EB), distorted interstitial architecture

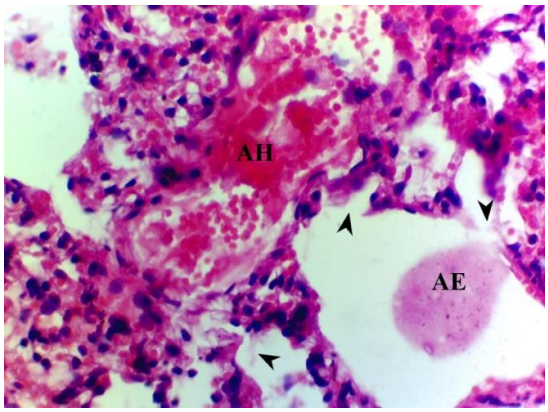

Fig. 6: A photomicrograph of lung of albino rat (4 weeks exposure of 4% formaldehyde). H&E X 400. Showing Alv wall thickness, Alv wall disruption (Arrow heads), distorted interstitial architecture, inflammatory infiltrates, Alv. edema (AE) and Alv. haemorrhage (AH).

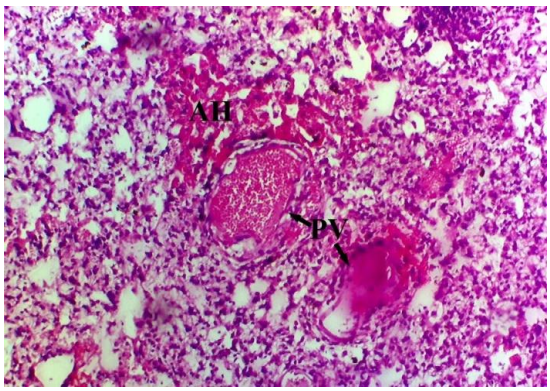

Fig. 7: A photomicrograph of lung of albino rat (4 weeks exposure of 8% formaldehyde). H&E X 100. Showing Alv wall thickness, Alv space narrowing, distorted interstitial architecture, inflammatory infiltrate, Alv haemorrhage (AH), pulmonary vasculitis (PV).

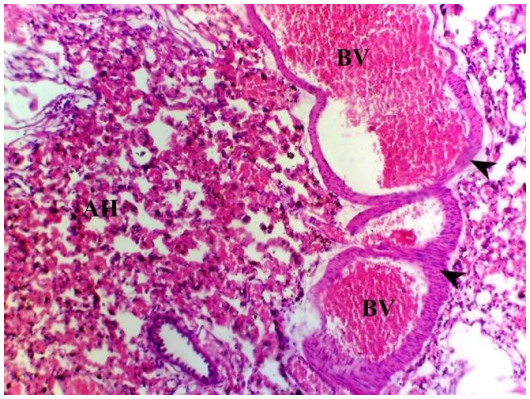

Fig. 8: A photomicrograph of lung of albino rat (4 weeks exposure of 40% formaldehyde). H&E X 100. Showing distorted architecture, alveolar haemorrhage (AH), dilatation and congestion of blood vessels (BV), thickening of blood vessel wall (arrow heads).

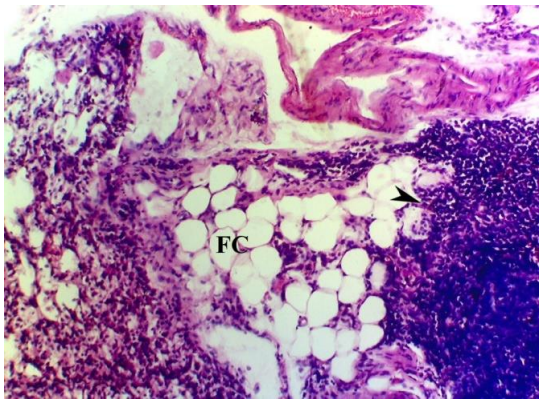

Fig. 9: A photomicrograph of lung of albino rat (4 weeks exposure of 4% formaldehyde). H&E X 100. Showing distorted architecture, dilatation of blood vessel, inflammatory infiltrates, lymphoid tissue aggregation (arrow head), fat cells infiltration (FC).

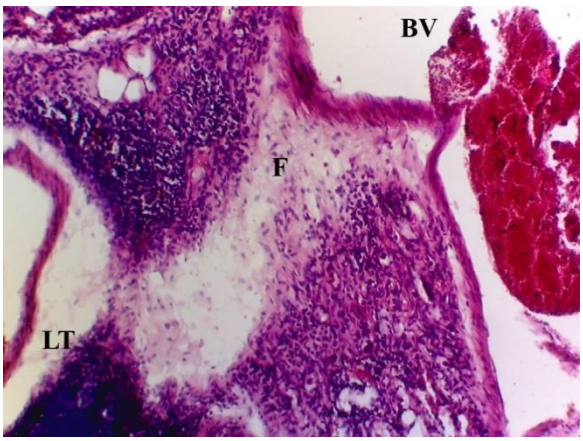

Fig. 10: A photomicrograph of lung of albino rat (4 weeks exposure of 8% formaldehyde). H&E X 100. Showing dilatation and congestion of blood vessel (BV), inflammatory infiltrates, lymphoid tissue aggregation (LT), foci of fibrosis (F).

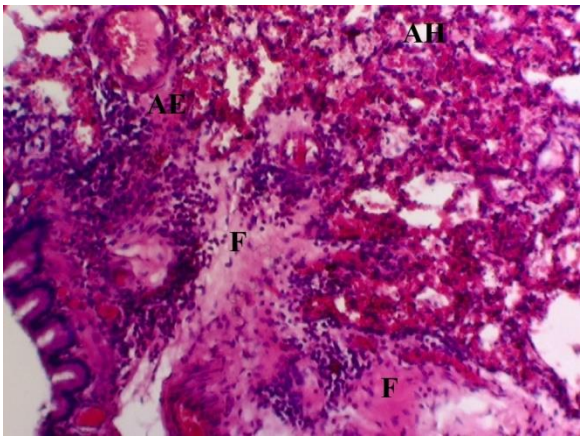

Fig. 11: A photomicrograph of lung of albino rat (4 weeks exposure of 40% formaldehyde). H&E X 100. Showing distorted interstitial architecture, Alv. edema (AE) and Alv. haemorrhage (AH), inflammatory infiltrates, foci of fibrosis (F)

STATISTICAL ANALYSIS

For statistical significance, on applying the Fischer exact test we have seen that the exposure of formaldehyde for 28 days was significantly associated (p value < 0.05) with the alveolar wall thickness, alveolar space narrowing, alveolar wall disruption, distorted interstitial architecture, alveolar edema, alveolar haemorrhage, dilatation and congestion of blood vessels, inflammatory infiltrates and lymphoid tissue hyperplasia at all 4%, 8% as well as 40% concentration of formaldehyde. Further, we noted that emphysema, pulmonary vasculitis, thickening of blood vessel wall, fatty infiltration in pulmonary interstitium and pulmonary fibrosis was not significantly associated (p value > 0.05) at any concentration of formaldehyde on 28 days of exposure of formaldehyde (Fig. 12).

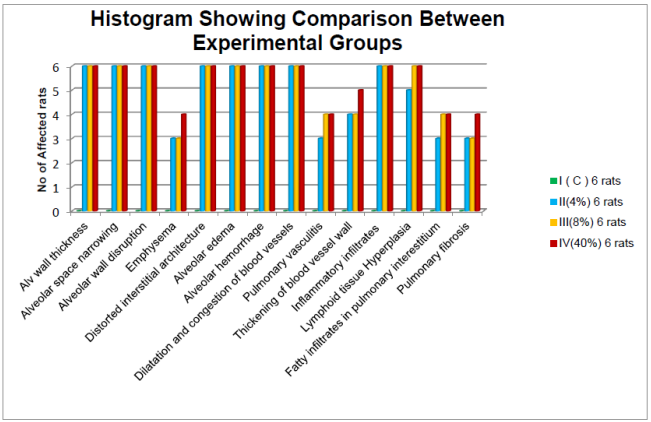

Fig. 12: Histogram showing comparison between experimental groups with no. of rats affected by different concentration of formaldehyde solution.

DISCUSSION

It is evident in the present study that the exposure of formaldehyde solution resulted in distinctive alteration of architecture of the lungs of albino rats. Table 1 is showing the number of rats in which particular finding is present in all groups.

Acute lung injury (ALI) (also called non cardiogenic pulmonary edema) is characterised by the abrupt onset of significant hypoxemia and bilateral pulmonary infiltrates in the absence of cardiac failure. Acute respiratory distress syndrome (ARDS) is a manifestation of severe ALI. Both ARDS and ALI are associated with inflammation-associated increases in pulmonary vascular permeability, edema and epithelial cell death. The histologic manifestation of these diseases is diffuse alveolar damage (DAD). ALI is a well-recognized complication of diverse conditions, including both direct injuries to the lungs and systemic disorders. The pathogenesis of ALI/ARDS is initiated by injury of pneumocytes and pulmonary endothelium, setting in motion a viscous cycle of increasing inflammation and pulmonary damage [6].

In the present study, Alveolar wall thickness that means the increased cellularity of alveolar wall is observed. The interstitial tissue was thickened due to accumulation of inflammatory cells with edema [7]. Blood vessels in the airway proliferate the influence of growth factors such as vascular endothelial growth factors (VEGF) and may contribute to increase airway wall thickness [8]. This may be the reason of alveolar space narrowing.

Alveolar wall disruption or ulceration is observed as a result of the mechanism of excavation and desquamation of the surface epithelium and the supporting tissues of the alveolar wall [9]. Due to injury of wall ultimately the interalveolar septa ruptures and bulla formation occurs and leads to Emphysema. Thus the distorted architecture of pulmonary interstitium is present in all concentrations.

Alveolar edema can be due to increase in capillary permeability as a result of microvascular injury due to formaldehyde inhalation and is present in all the rats of experimental groups. The mechanism of polymorphonuclear leukocytes inflammatory cells invasion induced by formaldehyde inhalation can be explained as inhaled formaldehyde rapidly increases vascular permeability in rat airway and produces microvascular leakage in the airway through stimulation of tachykinin NK1 receptors by tachykinins released from sensory nerves [10]. This ongoing inflammation leads to alveolar haemorrhage and dilatation and congestion of blood vessels. In this sequence, pulmonary vasculitis was prominently seen along significant thickening of blood vessels.

Whenever there is exposure to some noxious substance like formaldehyde, body‘s immune system reacts to counter the effects, as a result there is cellular infiltration in the lungs [11]. As a result of cellular injury, inflammatory infiltrates were present significantly in almost all of the tissue sections along with lymphoid tissue proliferation. In some of the sections fatty infiltration was also there.

When the exposure occurs consistently, there is ongoing process of injury, tissue destruction and attempts for healing by connective tissue forming foci of fibrosis. This fibrosis is observed in a number of sections, especially exposed with higher concentration.

These findings are also present in the studies done previously and they are compared with the present one (Table 2).

CONCLUSION

In the present study, we found that the exposure of formaldehyde affects significantly on the histopathology of lungs. The severity of findings increases with the increase in concentration of exposure.

As the formaldehyde is one of the cause of asthma and it can do airway inflammation with harmful changes as in young smokers, it can be clearly said that we are equally prone to diseases like asthma and respiratory distress syndrome. So this

knowledge is very essential for us as anatomists, pathologists, embalmers, technicians, medical and veterinary student to be cautious of the harmful effects associated with formaldehyde inhalation.

Table 2: Comparison of the findings of present study with the studies done previously

FINDINGS	Sheela, Sreedevi [12] (1991)	Turkoglu et al [13] (2008)	Njoya et al [9] (2009)	Bansal et al [7] (2011)	Mohamed et al [14] (2012)	Odinko et al [15] (2012)	Mehdi et al [16] (2014)	Chinedum et al [17] (2014)	Uche et al [11] (2015)	Afrin et al [18] (2016)	Verma et al [19] (2016)	Cheng et al [20] (2016)	Present study (2018)
Alveolar wall thickness	√			√	√			√					√
Alveolar space narrowing					√								√
Alveolar wall disruption/ulceration			√	√	√	√	√	√	√				√
Emphysematous bullae				√	√						√		√
Distorted interstitial architecture				√				√	√		√	√	√
Alveolar edema				√		√		√				√	√
Alveolar hemorrhage				√		√	√	√		√	√	√	√
Dilatation and Congestion of blood vessels		√		√	√		√			√	√	√	√
Pulmonary vasculitis					√								√
Thickening of blood vessel wall				√									√
Inflammatory infiltrates	√	√		√		√	√	√	√		√	√	√
Lymphoid tissue Hyperplasia	√				√						√		√
Fatty infiltrates in pulmonary interestitium		√											√
Pulmonary fibrosis			√		√	√	√		√				√

REFERENCES

1. World Human Organization. Formaldehyde, Air Quality Guidelines. Copenhagen, Denmark; 2001.
2. Formaldehyde Safety Guidelines. Environment health and safety. Concordia University, August 2016; EHS-DOC-141 vol 1.
3. Kerns WD, Pavkov KL, Donofrio DJ, Gralla EJ, Swenberg JA. Carcinogenicity of formaldehyde in rats and mice after long term inhalation exposure. Cancer Res. 1983; 3:4382-92.
4. Interntional Agency for Research on Cancer (IARC Monographs on the evaluation of carcinogenic risks to humans). Formaldehyde, 2-butoxyethanol and 1-tert-butoxy-2-propanolol. Lyon. 2004. (IPCS). Safety Chemical on Programme.
5. Formaldehyde (HCHO), CAS 50-00-0; UN 1198, UN 2209 (formalin) Toxic substance portal, Agency for toxic substances and disease registry.
6. Kumar V., Abbas AK, Aster JC. Robbins and Cotran Pathologic Basis of Disease. Ninth edition. Chapter 15, The Lung, Acute Lung Injury. Page 94, 116, 672-73, 677.
7. Bansal N, Uppal V, Pathak D. Toxic effects of Formaldehyde on the Respiratory organs of rabbits; a light and electron microscopic study. Toxicol Ind Health. 2011; 27(6);563-9.
8. Ryoko K, Izumi K, Masanori T, Mio M., et al. Alteration in airway microvascular leakage induced by sensorineural stimulation in rats exposed to inhaled formaldehyde. Toxicol Letters. 2010; 199 (3): 254-260.
9. Njoya HK et al. Histopathological effect of exposure of Formaldehyde vapour on the trachea and lung of adult wistar rat. International Journal of Integrative Biology. 2009;7(3): 160.
10. Kumari K, Rana AC. A Review on epidemiology, pathophysiology and management of asthma. Journal of applied pharmaceutical science. 2012; 2(7): 55-64.
11. Uche HC, Chimuanya DU, Chinazo UA, Ifedioranma SO. Pulmonary Changes in the Lungs of Wistar rats exposed to X-ray film developer solutions. International Journal of Health Sciences and Research. 2015; 5(12).
12. Sheela R, Sreedevi P. Formalin induced changes in the lung: an experimental study in rats. Journal of the Anatomical Society of India. 1991;40(2): 97-103.

13. Türkoğlu AO, Mustafa S, Neriman C, İsmail Z, Tuncay K, Pekmez H, Taş U. Formaldehyde induced damage in lungs and effects of caffeic acid phenethyl ester: A light microscopic study. Eur J Med. 2008; 5(3):152- 156.

14. Mohamed AMT, El-Ashtokhy M, Ahmed HM, Ibrahim OY. Anatomical and Histological effects of formaldehyde inhalation on the lung of albino rat. Journal of American Science. 2012; 8 (9).

15. Odinko CD, Oladele AA, Aneasato AP, Olugbenga MA, Oyadonghan GP. The histological effects of formaldehyde vapour on the lungs. International Journal of Basic, Applied and Innovative Research. 2012, 1(4):176-182.

16. Mehdi AH, Saeed AK, Hassan SMA, Salmo NAM, Maaruf NA. Histopathologic changes in rat organs upon chronic exposure to formaldehyde vapour. Bas J Vet Res. 2014; 1(2).

17. Chinedum OK, Ndukaku OY, Ifeanyi OE, Ndubuisi OT. The effect of formaldehyde vapour on the lungs of rabbits. IOSR-Journal of Dental and Medical Sciences. 2014; 13 (9)I: 83-93.

18. Afrin M, Amin T, Karim MR, Islam MR. Gross and Histomorphological effects of formaldehyde on brain and lungs of swiss albino mice. Asian Journal of Medical and Biological Research. 2016; 2(2).

19. Verma JK, Srivastav NN, Gupta NK, Asghar A. Effect of formalin exposure in the liver, kidney and spleen of albino rats: A morphological and histological study. Ejpmr, 2016; 3(8): 591-601.

20. Cheng J, Zhang L, Tang Y, Li Z. The toxicity of continuous long term low dose formaldehyde inhalation in mice. Immunopharmacology and Immunotoxicology. 2016; 38(6): 495-501.

Original Article

FETAL HEAD ANTHROPOMETRY: A CROSS-SECTIONAL STUDY FROM KUMAUN REGION

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ABSTRACT

Introduction: Biparietal diameter (BPD) and head circumference (HC) are important for estimating gestational age (GA), monitoring fetal growth and to rule out congenital abnormalities. Western references using HC and BPD can lead to erroneous GA estimation, therefore regional reference is required.

Aim: To measure HC and BPD in fetus at different GA, their relationship with GA and comparison of HC and BPD with expected HC and BPD by "Hadlock's formula".

Material & Methods: CRL, HC and BPD were measured in 72 fetuses. Mean and standard deviation of HC and BPD were calculated for all fetuses and across three trimesters. The correlation of HC and BPD with GA was calculated and p value was derived. Hadlock's HC and BPD were calculated for the gestational age. The observed HC and BPD in the study were compared with the Hadlock's value to find out any difference between them

Results: The mean HC of fetuses was 23.7 ± 8.58 cm. The mean HC in first trimester was 6.3 cm, 15.13 cm in second trimester and 30.8 cm in third trimester. The mean HC of fetuses according to Hadlock's formula was 23.72 ± 8.80 cm. The mean Hadlock's HC in first trimester was 5.6 cm, 14.92 cm in second trimester and 31.12 cm in third trimester. The mean BPD in the studied fetuses was 5.92 ± 2.24 cm. The mean BPD in first trimester was 1.7 cm, 4.8 cm in second trimester and 7.8 cm in third trimester. The mean Hadlock's BPD was 6.33 ± 2.41 cm. The mean Hadlock's BPD in first trimester was 1.6 cm, 4.4 cm in second trimester and 8.3 cm in third trimester. The mean HC of fetuses were nearly equal to mean Hadlock's formula, while BPD of the study fetuses was less than mean Hadlock's BPD. Both HC and BPD measured at different GA showed increase, with increase in GA and strong positive correlation and statistically significant association.

Conclusion: This study had shown that while HC is nearly equal to Hadlock's reference, BPD was less than Hadlock's for GA, reflecting need of local reference data for accurate fetal age estimation.

Keywords: Head circumference, biparietal diameter, fetus.

INTRODUCTION

Antenatal measurement of multiple fetal parameters is important for assessing fetal wellbeing and monitoring intrauterine growth. Head circumference (HC) and biparietal diameter (BPD) are routinely measured by ultrasound in second and third trimester of pregnancy [1]. BPD and HC are important for estimating gestational age (GA), monitoring fetal growth and to rule out congenital abnormalities. Various ultrasound-based formulas using HC and BPD are available for GA estimation but they are mostly western based data but variations exist based on races, ethnic group and

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nutritional status, like African babies have higher HC and Indian babies have low HC [2]. World Health Organization Multicentric Growth Reference Study (MGRS) provides set of reference growth curve chart for fetal development but large studies have shown marked difference in HC among national and ethnic group. Therefore, use of single HC reference is not justified. Statistical data from local population is urgently needed for accurate assessment of GA [3].

Ultrasound-based studies measuring HC and BPD are found from India [4,5], however anthropometric studies are limited, if any from Kumaun region, Uttarakhand. This anthropometric study provides a unique opportunity for measurement of HC, BPD at different GA and their relationship with GA. We also compared measured HC and BPD with "Hadlock's formula" values to observe the difference if any exist among the two.

MATERIAL AND METHODS

This cross-sectional study was done in Department of Anatomy, Government Medical College, Haldwani, Nainital, Uttarakhand. Study involved 72 spontaneously aborted human fetuses from 10 to 42 weeks of gestation. The menstrual GA was taken from the history. Inclusion criteria were spontaneously aborted fetus and known menstrual GA. Exclusion criteria were congenital abnormality involving head, face and neck; unsure menstrual GA, intrauterine growth retardation and poor nutritional status.

All measurements were taken with help of a flexible, non-stretchable metal ruler. The measurements were recorded in centimeters (cm), with values rounded off to first decimal place. HC was taken as widest possible circumference of head from broadest part of forehead above eyebrow, above the ear to most prominent part in posterior head above occiput [6]. BPD was measured from greatest transverse diameter of the head, which extends from one parietal boss to the other.

Three group were divided among fetuses according to GA in to first, second and third trimester. First group comprises of GA up to 12 weeks, second trimester with fetuses from 13 weeks to 26 weeks of GA and last trimester above 26 weeks. Mean and standard deviation of CRL, HC and BPD were calculated for all fetuses and across three different trimesters. The Pearson correlation coefficient of CRL, HC and BPD with GA was calculated and p value was derived to see whether CRL, HC and BPD had statistically significant association with GA. Hadlock's HC and BPD were calculated for the gestational age and the observed HC and BPD in the study were compared with the Hadlock's value [7] to find out if any difference between them exist. Graph was plotted for different value of CRL, HC and BPD against GA to show their relations.

OBSERVATIONS AND RESULTS

Out of a total of 72 fetuses, 38 were male fetuses and 34 were female fetuses. There were 3 fetuses in first trimester, 32 in second trimester and 37 in third trimester. The mean CRL of male and female fetuses were 23.62 ± 8.00 cm and 22.68 ± 7.02 cm, respectively.

The mean HC of fetuses was 23.7 ± 8.58 cm (Table 1). The mean HC in first trimester is 6.3 cm, 15.13 cm in second trimester and 30.8 cm in third trimester. The HC measured at different GA showed increase in head circumference with increase in GA (Fig. 1) and strong positive correlation with correlation coefficient of 0.96 and significant statistical association with GA when p value less than 0.01 was considered as significant (Table 1). The mean HC of fetuses according to Hadlock's formula was 23.72 ± 8.80 cm. The mean Hadlock's HC in first trimester is 5.6 cm, 14.92 cm in second trimester and 31.12 cm in third trimester (Table 2). A graph plotted for comparing HC obtained for all fetuses and expected Hadlock's HC for respective GA, shows both HC to be nearly equal (Fig. 2). Across all three trimesters, the measured HC is nearly equal to expected Hadlock's HC (Fig. 3).

The mean BPD in the studied fetuses was 5.92 ± 2.24 cm (Table 1). The mean BPD in first trimester is 1.7 cm, 4.8 cm in second trimester and 7.8 cm in third trimester (Table 2). The expected BPD according to Hadlock's formula was also calculated; the mean Hadlock's BPD was 6.33 +/-2.41 cm. The mean Hadlock's BPD in first trimester is 1.6 cm, 4.4 cm in second trimester and 8.3 cm in third trimester (Table 2). The BPD measured for different GA showed increase in BPD with increase in GA (Fig. 1) and showed strong positive correlation with correlation coefficient of 0.99 and significant statistical association when p value less than 0.01 considered as significant (Table 1). A graph plotted for comparing BPD obtained for all fetuses and expected Hadlock's BPD for respective GA, shows Hadlock's BPD to be higher than measured BPD (Fig. 4). Across all three trimesters, the measured BPD is less than expected

Hadlock's BPD (Fig. 5).

Table 1: Mean and standard deviation of CRL, HC and BPD and their correlation and p value with GA

Parameter (cm)	Mean (cm)	St Dev (cm)	r value	p value
CRL	23.17	8.00	0.989617	Significant
HC	23.7	8.58	0.959974	Significant
BPD	5.92	2.24	0.994524	Significant

Table 2: Mean BPD, mean Hadlock's BPD, mean HC and mean Hadlock's HC in first, second and third Trimester

Trimester	BPD (cm)	Hadlock BPD (cm)	HC (cm)	Hadlock HC (cm)
First	1.73	1.66	6.3	5.66
Second	4.12	4.4	15.13	14.92
Third	7.83	8.3	30.8	31.12

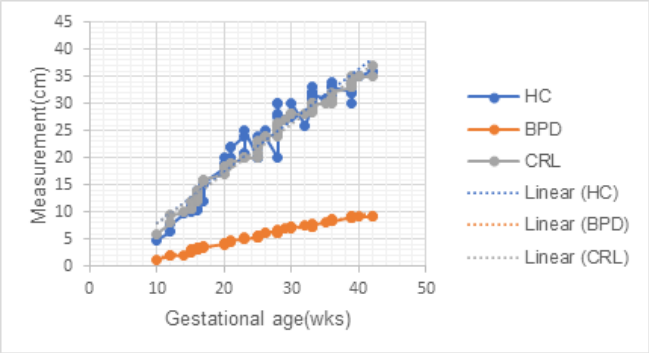

Fig. 1: HC, BPD and CRL on y axis in cm and gestational age in weeks on x axis. CRL, HC and BPD increases with increase in GA

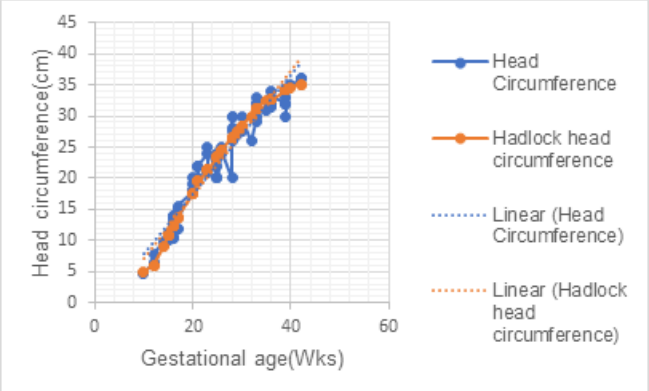

Fig. 2: HC and Hadlock's HC on y axis and gestational age on x axis; both HC and Hadlock's HC are equal

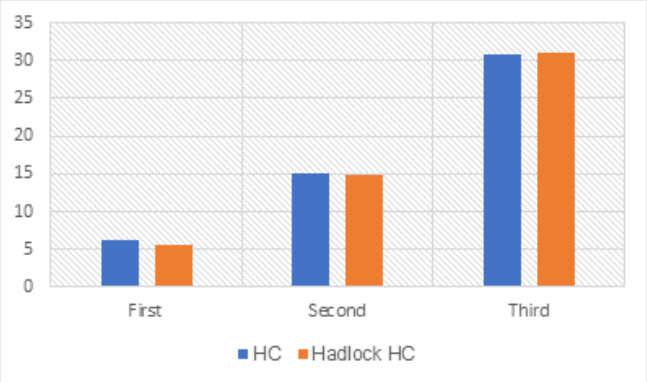

Fig. 3: Mean HC (blue) and Hadlock's HC (orange) in first, second and third trimester

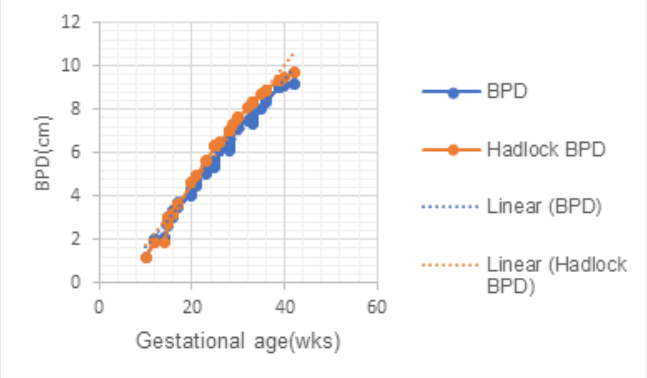

Fig. 4: BPD and Hadlock's BPD on y axis and gestational age on x axis. Hadlock's BPD is higher than study BPD

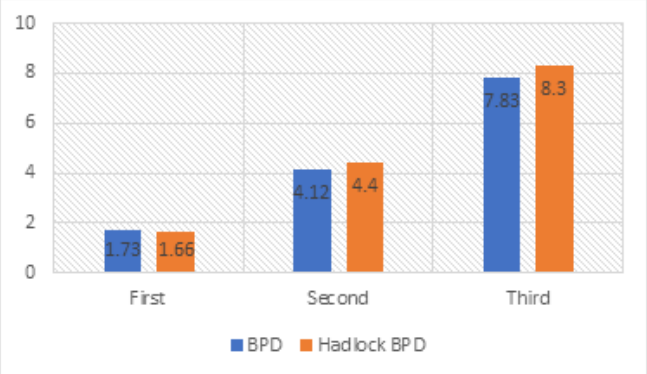

Fig. 5: Mean BPD (blue) and Hadlock's BPD (orange) in first, second and third trimester

DISCUSSION

HC measurement is a surrogate marker of brain size and brain growth and integral part of Pediatric Neurological Examination [8]. Normal range of HC is important as marked variation in HC was noted among different population. Asian newborns were found to

have smaller HC than Caucasian newborn [9]. Head size above and below two standard deviation places head into macrocephaly (large head) and microcephaly (small head). The underlying causes of macrocephaly and microcephaly may be just an anatomical cause but may signify important congenital abnormalities. Periodic antenatal ultrasound scans can detect early abnormal growth of various head parameter, helping in early detection of various congenital abnormalities affecting head [8].

Growth of fetus is different between populations. Indian babies are considered to be smaller than western population [10] but this is not proportionate for all the measurements, as a comparative study between UK and India showed birth weight and abdominal circumference to be much less in comparison to length and subscapular skinfold [11].

Gestational age estimation is based on various models that are western population based like Hadlock's (AC-HC), Woo's (AC-BPD) model, Combs (AC-HC-FL) and Hadlock-3 (AC-HC-FL) models. But directly applying western based models on Indian population can lead to higher errors on Indian population, therefore need of models based on native Indian population is essential; for that fetal head anthropometric measurement are needed [2].

Deloison et al. (2012) studied pregnancies outcomes in which the fetal HC was below the 5th centile in second-trimester scan of 18,377 women. They found that 3.7% of fetuses had HC below the 5th centile. They found that in comparison to fetuses with normal HC, fetuses with progressively less HC for GA have much higher chances of neurological abnormalities and associated with poor pregnancy outcome. A HC less than 5th centile is associated with various neurological disorders. HC with z score below 2.5 was strongly associated with neurological and chromosomal abnormalities [12].

Abnormally large head for gestational age is associated with various obstetrical complications, due to mismatch between large fetal head and maternal pelvis leading to cephalopelvic disproportion (CPD). CPD can leads to obstructed labor, one of the leading causes of obstetrical death in developing countries and are more common in primigravidae. Fetus with large head are associated with difficult delivery leading to increasing likelihood of emergency lower segment cesarean section and assisted delivery. Other complications include shoulder dystocia, prolonged labor and signs of fetal distress. Thus, head parameters become more relevant in predicting mode of delivery and necessary steps to prevent complications [13-15].

The mean BPD in the studied fetuses was 5.92+/-2.24 cm and mean Hadlock's BPD was 6.33 +/-2.41 cm. The mean BPD in first trimester is 1.7 cm, 4.8 cm in second trimester and 7.8 cm in third trimester and is found to be lower when compared to expected mean Hadlock's BPD which is 1.6 cm in first trimester, 4.4 cm in second trimester and 8.3 cm in third trimester (Table 2, Fig. 5). This study showed linear increase in BPD with increase in GA.

Jaiswal et al. (2015) assessed GA in local population (southern zone) of Rajasthan by measuring fetal BPD with ultrasound in pregnant females in their second and third trimester with known gestational age by last menstrual period. They found that BPD shows linear increase with increasing GA and mean BPD in Indian population is lower than western studies but correlated with Hadlock's series and they suggested that the difference is possibility due to racial, genetic, nutritional and socioeconomic factor [5].

Chan and Yeo (1991) measured BPD by ultrasound in 1442 Chinese fetuses between 17 to 40 weeks of GA and calculated the two standards of error. They compared the results with 2 standard errors of the BPD of the Caucasian fetuses. They found statistical difference between two means and the 2 standard errors and emphasized that nomogram for local regional population is needed [16].

The mean HC and Hadlock's HC for respective GA were 23.7 +/-8.58 cm and 23.72+/-8.80 cm, respectively. Kinare et al. (2010) in their study from Pune, India measured HC and BPD by ultrasound in 653 singleton pregnancies and they found that HC of fetuses in their study was comparable to that of French reference at 18 and 36 weeks of gestation; BPD in Indian fetuses was smaller than French reference for same GA. The study stressed that Indian fetuses were smaller then French counterpart [17]; however, Warrier and Ashokan (2016) found HC to be less in Indian fetuses as compared to western population for respective GA. HC may vary across different races and following criteria of western population can result in inaccurate GA estimation and microcephaly [4].

Natale and Rajagopalan (2014) in their study compared growth parameters among economically advantage children across 55 countries and compared it with WHO's Multicentre Growth Reference Study (MGRS). They found marked difference in HC among national and ethnic group and following WHO set of

reference growth curve chart can lead to misdiagnosis of many children having microcephaly or macrocephaly. Hence use of single HC reference is not justified [3].

The study reflects that both HC and BPD shows linear increase with increase in GA and HC to be nearly equal to that of Hadlock's HC and BPD to be lower than Hadlock's BPD. Study is limited by number of representative fetuses of different GA, requiring larger studies for findings to be clinically useful.

CONCLUSION

HC and BPD are important marker for estimation of GA and fetal growth monitoring. Western based data are often used but different racial, geographical and ethnical factor and nutritional factors leads to different BPD and HC. This study had shown that while HC is nearly equal to Hadlock's reference, BPD was less than Hadlock's for GA, reflecting need of local reference data for accurate fetal age estimation and growth monitoring.

REFERENCES

1. Schwarzler P, Bland JM, Holden D, Campbell S, Ville Y. Sex-specific antenatal reference growth charts for uncomplicated singleton pregnancies at 15–40 weeks of gestation. Ultrasound Obstet Gynecol. 2004;23:23-9.
2. Hiwale SS, Misra H, Ulman S. Ultrasonography-based fetal weight estimation: Finding an appropriate model for an Indian population. Journal of Medical Ultrasound. 2017;25(1):24-32.
3. Natale V, Rajagopalan A. Worldwide variation in human growth and the World Health Organization growth standards: a systematic review. BMJ Open. 2014;4(1):e003735.
4. Warrier HG, Ashokan KM. Fetal biometry in late 3rd trimester for gestational age Indian standards. Int J Sci Stud. 2016;3(12):295-298.
5. Jaiswal P, Masih WF, Jaiswal S, Chowdhary DS. Assessment of fetal gestational age by ultrasonic measurement of bi-parietal diameter in the southern part of Rajasthan. Med J DY Patil Univ. 2015;8:27-30.
6. https://www.cdc.gov/zika/pdfs/microcephaly_measuring.pdf
7. Hadlock FP, Deter RL, Harrist RB, Park SK. Estimating fetal age: computer-assisted analysis of multiple fetal growth parameters. Radiology. 1984;152(2):497-501.
8. Menounou A. Head size: Is it important? *Advances in Clinical Neuroscience and Rehabilitation. 2011;11(2):16-20.*
9. Davies DP, Senior N, Cole G, Blass D, Simpson K. Size at birth of Asian and White Caucasian babies born in Leicester: implications for obstetric and paediatric practices. Early Human Development. 1982;3(6):257-263.
10. Sachdev HPS. Low birthweight in South Asia. In: Gillespie S, ed. Malnutrition in South Asia; A Regional Profile. UNICEF; 1997.
11. Yajnik CS, Fall CH, Coyaji KJ, Hirve SS, Rao S, Barker DJ et al. Neonatal anthropometry: the thin-fat Indian baby. The Pune Maternal Nutrition Study. Int J Obes Relat Metab Disord. 2003;27(2):173-180.
12. Deloison B, Chalouhi GE, Bernard JP, Ville Y, Salomon LJ. Outcomes of fetuses with small head circumference on second trimester ultrasonography. Prenatal Diagnosis. 2012;32:869-874.
13. Stulp G, Verhulst S, Pollet TV, Nettle D, Buunk AP. Parental height differences predict the need for an emergency caesarean section. PLoS ONE. 2011;6(6):e20497. doi:10.1371/journal.pone.0020497.
14. Elvander C, Hogberg U, Eke´us C. The influence of fetal head circumference on labor outcome: a population-based register study. Acta Obstet Gynecol Scand. 2012;91:470-475.
15. Gardberg M et al. Malpresentation—impact on mode of delivery: Acta Obstetricia et Gynecologica Scandinavica. 2011. Nordic Federation of Societies of Obstetrics and Gynecology; 90;540-542.
16. Chan WB, Yeo GS. A comparison of fetal biparietal diameter measurement in local Chinese and Caucasian population. Singapore Med J. 1991;32(4):214-7.
17. Kinare AS, Chinchwadkar MC, Natekar AS et al. Patterns of fetal growth in a rural Indian cohort and a comparison with a western European population, data from the Pune Maternal Nutrition Study. Journal of ultrasound in medicine : official journal of the American Institute of Ultrasound in Medicine. 2010;29(2):215-223.

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Original Article

A MORPHOMETRIC STUDY OF NASAL INDEX IN ADULT HUMAN DRY SKULLS OF NORTH INDIAN POPULATION

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ABSTRACT

Introduction: Nasal Index is very useful in anthropology and it is one of the clinical anthropometric parameters recognized in nasal surgical and medical management. Nasal index is the most common nasal parameter which may be related to regional and climatic differences so that it would be further useful as an essential tool to the researchers, clinicians, rhinoplastic and facial reconstructive surgeons and forensic experts related to this field. The present study was designed to provide a normative data of nasal index and to classify their nose type and comparison of data with other studies.

Material & Methods: The study was conducted on 200 human dry skulls of north Indian population in Department of Anatomy, S.N. Medical College, Agra. The measurements were taken using digital vernier caliper. Nasal Index was calculated by measuring nasal height and nasal width in order to determine the nasal type.

Results: In the present study, mean nasal height was 49.25±3.68mm whereas mean nasal width was 24.63±2.90mm. Mean nasal index was calculated as 51.00± 0.09.

Conclusion: The findings of our study suggest that according to the nasal index, the studied population of North India belongs to Platyrrhine type.

Keywords: Nasal index, human dry skulls, digital vernier caliper.

INTRODUCTION

Anthropometry provides scientific methods and techniques for taking various measurements and observation on the living man and the skeleton [1]. Nasal anthropometry is the study concerned with the measurements of the proportion, size and shape of the human nose [2]. The importance of the nose is so great in determining regional, climatic differences and facial reconstructive surgery that one might label it “Nasal science” [3].

Nasal index is a sensitive anthropometric index. It is the most common nasal parameter which may be related to regional and climatic differences [4]. Before changing the state of the nose, analysis of the nasal index is the initial step a specialist takes before performing rhinoplasty.

It is useful in various branches of medicine such as reconstructive surgery, in forensic medicine for medicolegal assessment of individuality and race [5]. Nasal index is also useful in the analysis and classification of fossil remains as well as the study of living population [6].

MATERIAL AND METHODS

The present study was conducted on 200 human dry skulls in Department of Anatomy, S. N. Medical

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College, Agra out of which 125 skulls were from S. N. Medical College, Agra and 75 were taken from G.S.V.M. Medical College, Kanpur.

Nasal height and nasal width were measured with the help of digital vernier caliper (with an accuracy of 0.01 cm). All the measurements were taken thrice to minimize measurement error and mean of the three obtained value was used. After data collection, results were prepared in terms of mean and standard deviation using software SPSS version 23.0.

Measurements: In each skull following measurements were taken:

Nasal Height (NH): Nasa**l** Height was measured from the nasion (where the internasal suture touches the frontal bone) to a point just at the base of nasal spine (Fig.1).

Nasal Width (NW): Nasal Width is the greatest breadth of nasal aperture (Fig. 2).

Nasal Index (NI): Nasal Index is calculated by the following

$$\frac{\text{Nasal Width} \times 100}{\text{Nasal Height}}$$

Above measurements were compared with studies of different authors as anthropometric measurements are different in different population and geographical areas.

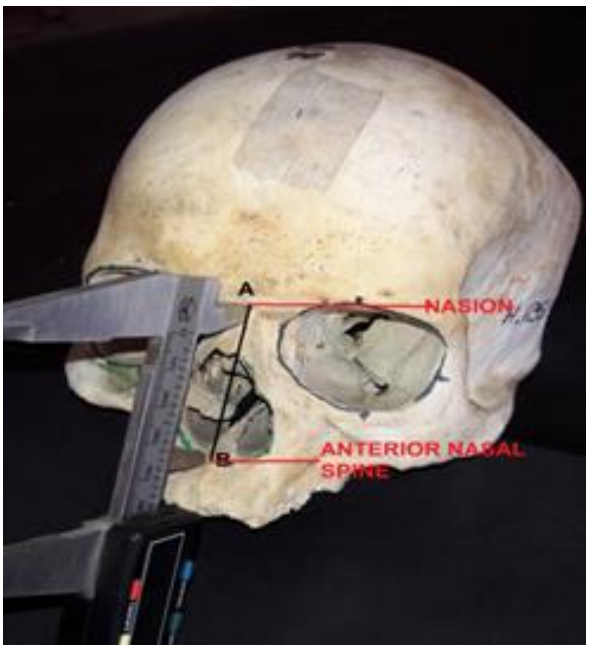

Fig. 1: Measurement of Nasal Height (A-B: Distance from the nasion (where the internasal suture touches the frontal bone) to a point just at the base of the nasal spine)

Fig. 2: Measurement of Nasal Width (A-B: Maximum distance on the nasal opening in the skull)

OBSERVATIONS AND RESULTS

The maximum, minimum and mean value of Nasal height was 59.27 mm, 38.26 mm and 49.25 ± 3.68 mm respectively. The maximum, minimum and mean value of Nasal width was 36.22 mm, 17.46 mm and 24.63 ± 2.90 mm respectively (Table 1).

The maximum value of Nasal Index was 72.00, minimum value 40.00 and mean value was 51.00 ± 0.09 (Table 1, Fig. 3).

Table 1: Showing Nasal Height, Nasal Width & Nasal Index in 200 Human Dry Skulls

Parameters	Sample (human dry skulls)	Maximum	Minimum	Mean	SD
Nasal Height	200	59.27mm	38.26mm	49.25mm	3.68mm
Nasal Width	200	36.22mm	17.46mm	24.63mm	2.90mm

Nasal Index	200	72.00	40.00	51.00	0.09

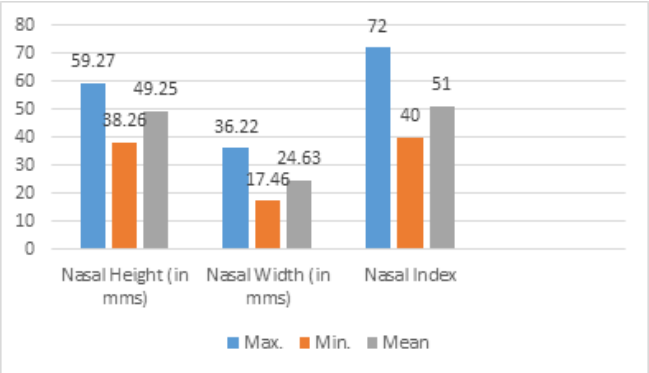

Fig. 3: Bar diagram showing Nasal Height, Nasal Width & Nasal Index

DISCUSSION

Nose is very important in racial determination [7]. The classification of nose into different categories is a function of Nasal Index in anthropology as it is applied in differentiating racial and ethnic variations. Based on nasal anthropometric parameters, nose has been classified into following types by Martin & Saller [8] as:

Leptorrhine: Moderately narrow nose with nasal index ≤47.

Mesorrhine: Moderate or medium size nose with nasal index 47-50.9.

Platyrrhine: Moderately wide nose with nasal index 51-57.9.

Hyperplatyrrhine: Very wide nose with nasal index ≥58.

Number of studies has indicated racial and ethnic differences in nasal index amongst different populations. Leptorrhine with a nasal index below 48 as in mixed Europeans, ancient egyptians, American Indians; Mesorrhine with an index ranging from 48 to 53 as in Chinese, Japanese, Malays; Platyrrhine with an index above 53 as in Australians, Negroes, Kaffirs, Zulus etc. [9].

Present study shows the comparison of Nasal Height and Width between different population groups (Table 2).

Table 2: Showing comparison of Nasal Index between different population

Study	Population	Nasal Index
Abdelkader et al. (2005) [11]	European	47.8- 69.8
	Alaskan	47.8- 69.8
	African	38.0-59.0
Kulkarni (2010) [5]	South Indian	53.3 ± 5.3
Howale et al. (2012) [10]	Maharastra	54.30
Padala & Khan (2017) [12]	South Indian	51.95±7.20
Present study (2019)	North Indian	51.00 ± 0.09

According to the classification of Martin and Saller (1957) [8], Nasal Index was 51.00 ± 0.09 in present study which clearly revealed that North Indians belongs to Platyrrhine Type of Nose (Table 2).

CONCLUSION

The present study is designed to provide a normative data of nasal index in north Indian population and to classify their nose type and comparison of data with other studies, so that it would be further useful as an essential tool to the researchers, clinicians, rhinoplastic and facial reconstructive surgeons and forensic experts related to this field.

Data collected in the present investigation could serve as data base for the quantitative description of human nasal morphology during normal growth and development considering region and race related variation. Findings of the present study are useful for quantification of the nasal features of north Indian population. The findings of our study suggest that Nasal Index of North Indian population belongs to Platyrrhine category.

REFERENCES

1. Choudhary A, Chowdhary DS. Comparative anthropometric study of nasal parameters between two ethnic groups of Rajasthan state. International Journal of Medicine and Public health. 2012; 2 (2).
2. Eliakim-Ikechukwu C, Bassey T, Ihentuge et al. Study of the nasal indices and bialar angle of the Ibo and Yoruba ethnic groups of Nigeria. Journal of Biology, Agriculture and Healthcare. 2012; 2(11):149-152.
3. Moore KL, Dalley AF, Agur AMR. Head and Neck: Clinically oriented anatomy. South Asian ed. Lippincolt-Williams and Wilkins Publishers, 2018.
4. Hall RL, Hall DA. Geographic variation of native people along the pacific coast. Hum Biol. 1995; 67: 407-26.
5. Kulkarni V. Study of metrical & non metrical traits of skulls of south Indian population. 2010.
6. Alex FR., Steven B, Timothy GL. 1996. Human Body Composition. 4th ed. Human Kinetics Publishers. 1996; 4:167-172.
7. Madison G. The passing of the great race past 1 language and nationality 2004; chapter 2; 2-4.
8. Martin R, Saller K. Lehrbuch der Anthropologie. Gustav Fisher Verlag Stuttgart. 1957.
9. Cunninghamm Appedixied: Measurements & indices employed in physical anthropology. 286-289.
10. Howale DS, Jain LK, Iyer K et al. Orbital & nasal indices of Maharastra region: A direct measurement study using dry skulls. International Journal of Current Research. 2012; 4(8): 158-161.
11. Abdelkader M, Leong S, White PS. Aesthetic proportions of the nasal aperture in 3 different racial groups of men. Arch Facial Plast Surg. 2005; 7(2):111-113.
12. Padala SR, Khan N. Assessment of craniometric indices of adult human skulls of South Indian origin. International Journal of Medical and Health Research. 2017; 3(12): 155-160.

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ABSTRACTS

ABSTRACTS

AWARD SESSION

DR. VARSHA KATIRA GOLD MEDAL

SONOGRAPHIC EVALUATION OF SCIATIC NERVE ANATOMY AND SUBCUTANEOUS DEPTH AT ITS TERMINATION IN POSTERIOR THIGH: IMPORTANCE IN POPLITEAL BLOCKS

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Introduction: Sciatic nerve (SN) is about 2cm wide, forms in the pelvis from ventral rami of L4-S3 spinal nerves and leaves the pelvis by passing out via greater sciatic foramen inferior to piriformis. It travels in the posterior compartment of thigh where it is crossed by long head of biceps femoris, and terminates by dividing into tibial and common peroneal nerves proximal to knee near the apex of popliteal fossa. Cross sectional area (CSA) of SN at mid-thigh and the level of termination may vary. This is important in respect to clinical as well as treatment purpose for the performance of popliteal block. Popliteal nerve block is the block of SN in the popliteal fossa, it is ideal for surgeries of lower leg, particularly below the knee, foot and ankle. It anesthetizes the same dermatomes as both the anterior and lateral approaches to the SN. Variability in level of termination and subcutaneous depth may account for the frequent failures associated with popliteal block. Ultrasound guided sciatic nerve blockade when performed in a systematic manner, is associated with a high success rate.

Aims & Objectives: Present study was done to evaluate sciatic nerve morphometry and its depth from skin with the help of high resolution ultrasonography (HRUS) and highlight importance of relevant anatomy in relation to popliteal nerve block.

Material & Methods: Study was conducted in the Department of Anatomy, King George's Medical University, Lucknow, Uttar Pradesh, India in 50 volunteer students of 1st year MBBS 2018 batch (25 males & 25 females). Sonography was done with the help of Esaote Europe My Lab 40 ultrasound machine (installed in the Department of Anatomy, KGMU) to observe Cross sectional area, perimeter, level of termination of nerve and its depth from skin at a particular site.

Results: CSA ranged from 0.22-0.35±0.028cm^2 and perimeter ranged from 15.23-30.33±2.92 mm. The mean CSA of SN was equal on both sides ie. 0.27± 0.028 cm^2 on right and 0.27±-0.025 cm^2 on left. The perimeter of SN on right side was 21.27±2.92 mm and left side 20.29±2.05 mm. The depth of SN from skin on right side was 19.16±1.70 mm while on left side 19.16±1.70mm. The level of termination was on right side 77.65±4.31 mm while on left side 77.26±4.43mm proximal to popliteal crease.

Rt. SN mean CSA was almost equal among males and females whereas Lt. SN mean CSA was found to be significantly (p-value-0.048) greater in males as compared to females.

The perimeter of nerve had significantly (0.043) larger values on both right and left side in females as compared to male .The depth of SN from skin was slightly more in males as compared to females while level of termination was bilaterally almost similar in both males and female.

Conclusion: Normal values of various parameters of sciatic Nerve evaluated in our study will be helpful in guiding and facilitating popliteal blocks in various surgeries.

DR. O.P. KHANDURI MEMORIAL GOLD MEDAL

HISTOLOGICAL EFFECTS OF FORMALDEHYDE INHALATION ON THE ALVEOLAR ARCHITECTURE OF LUNGS OF ALBINO RATS

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Introduction: Formaldehyde is a flammable, colourless, reactive, readily polymerized gas at normal room temperature and pressure. Formaldehyde vapour is readily absorbed from the lungs. Formaldehyde is combined with methanol and buffers to make embalming fluid. In the dissection hall, during embalming or cadaveric dissection and histo-pathological preservation, medical professionals are exposed to formaldehyde vapours.

Aims and objectives: Respiratory system is the major target of formaldehyde. So, the present study aims to assess the histological changes on the architecture of alveoli of albino rats after inhalation of formaldehyde vapours.

Material and methods: 24 albino rats were exposed to formaldehyde vapours for 28 days. They were exposed with various concentrations and thus 4 groups, having 6 rats in each, were made. They were sacrificed and the lung tissue was taken and studied by using H & E stain.

Observations: The study shows a number of important histological changes which are concentration dependent.

Conclusion: It may be concluded from the present study that concentration of formaldehyde can affect significantly on the histopathology of the lungs of albino rats.

Keywords: Formaldehyde exposure, Lung alveoli architecture, histo-pathological changes.

ORAL PRESENTATION

Abs/19/01

MORPHOMETRIC STUDY OF FRONTAL HORNS OF LATERAL VENTRICLES OF THE BRAIN BY COMPUTED TOMOGRAPHY

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Introduction: Morphometric analysis of lateral ventricles of brain is important for evaluating changes due to growth, ageing, intrinsic and extrinsic pathologies. The present study was done to provide more information regarding size of frontal horns of lateral ventricles of the brain in normal western UP population.

Aim & Objectives: The objectives of the present study were,(1) measurement of the dimensions of frontal horns of lateral ventricles. (2) To compare the data with reference to gender, side in different age groups.

Material & Methods: The present study was carried from May 2014 to September 2015 on 200 patients [100 males and 100 females] in the age group of 10-80 years. GE OPTIMA CT 660 was used for obtaining the scans.

Result: With regard to side and gender, the length of frontal horn of right side has the range between 23.0-35.0mm and 23.0-36.0mm on the left side .In males, the morphometric measurements were more as compared to females. The length of frontal horn is more on left side than the right side in both the sexes with an insignificant increase in the size as the age increases.

Conclusion: The measurements of the frontal horns of lateral ventricles were more on the left side in both sexes and also more in males. This study may be useful while diagnosing visual disturbances, hydrocephalus, schizophrenia and psychotic disorders.

Abs/19/02

A MORPHOLOGICAL AND MORPHOMETRIC STUDY OF ACETABULUM OF DRY HUMAN HIP BONE

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Aim & Objectives: To study the morphology of acetabular margin and articular surface and to measure the various dimensions of acetabulum in dry human hip bones.

Material & Methods: A cross-section morphological and morphometric study was performed on 92 undamaged acetabulum of adult dry human hip bone of unknown age and gender. Shape of anterior margin of acetabulum and shape anterior and posterior ends of articular surface of acetabulum was observed. Morphometry was done by using Vernier caliper of accuracy of 0.01mm. Vertical diameter (VD), Transverse diameter (TD), Anteroposterior diameter (APD), Inter-notch distance (ND) and Depth of acetabulum were measured. Surface area (SA) and Volume (V) of acetabulum were calculated by mathematical calculation of Dome. Statically analysis was done by using SPSS software version 22.0. The Pearson's correlation test was used.

Results: In present study the anterior acetabular ridge was curved in 45.7% (42), angulated in 26.17% (24), straight in 13% (12) and irregular in 13% (12) bone. Anterior end of lunate articular surface was angulated and posterior end was lunate in shape in 45.7% (42) whereas in 54.3% (50) bone both the ends were Lunate in shape. Morphometric values mean± SD were as 48.21mm± 3.31(VD), 47.81mm± 3.37(TD), 48.79mm± 4.08(APD), 23.58mm± 2.77(ND), 27.45mm± 3.02(D), 4162.56mm^2± 755.58(SA) and 36563.65mm^3± 9408.67 (V).

Conclusion: The knowledge of these acetabular parameters is necessary for creation of acetabular prosthesis and surgical procedures such as acetabular reconstruction in hip joint surgeries.

Abs/19/03

ACCESSORY SPLEEN IN HUMAN FETUSES

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Objectives: The present study was aimed to investigate and identify the existence and location of accessory spleen in human fetuses.

Methods: Study was conducted in Department of Anatomy, GMC Haldwani, on 40 formalin preserved dead human fetuses (21 males and 19 females) with gestational age ranging from 14th to 40th week. The fetuses were procured from Dr Sushila Tiwari Hospital, Haldwani with due regards to ethical grounds after taking a well informed consent.

Result: The presence of accessory spleen was revealed in n=5 cases (12.5%) in form of rounded nodules near the hilum of the spleen. There was no significant predilection for the gestational age or the gender of the fetus.

Conclusion: Accessory spleen is the most common congenital anomaly of the spleen and is also clinically important surgically as well as radiologically.

Abs/19/04

ANATOMICAL APPROACH OF ANTENATAL RENAL PELVIC DILATATION FOR POST NATAL OUTCOME

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Introduction: As the renal anomalies are most common anomalies during gestation period to be found. Renal pelvis dilatation is one of the most common organ-specific fetal condition detected antenatally and one of the most difficult diagnostic challenges. As antenatal urinary tract obstruction may cause severe damage to the fetal kidney.

Aims and Objectives: To provide normative patterns of their growth and size during the second and third trimester, in both genders and both side by classifying it in mild, moderate and severe.

Materials and Methods: From obstetrics department 71 dead foetuses were collected, without any abnormalities to assess the pelvic dilatation and compare the data in both of sexes, sides and in second as well as third trimester.

Result: Student t test were used (p< .05) for stasticial analysis .it is mostly seen bilaterally, commonly in males and age above 20 gestational weeks. Severity increases with gestational age and gestational age is found to be no significant while both right and left side in moderate and sever cases were found to be significant (p <0.001).

Conclusion: Our novel risks are useful for antenatal counseling at presentation. The low frequency of obstruction/ vesicoureteral reflux and Hydronephrosis in mild renal pelvic dilatation raises questions over the most appropriate investigation of these cases. We suggest the need for a large prospective multicenter study and their results for additional prognostic indicators.

Abs/19/05

A STUDY OF VARIATION OF CELIAC TRUNK IN WESTERN U.P. POPULATION

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Introduction: The celiac trunk is first branch of the abdominal aorta arising at the level of T12-L1 vertebrae. The celiac Trunk trifurcates into the left gastric, common hepatic and splenic arteries. Sometimes the celiac trunk bifurcates into the splenic and hepatic arteries (hepato-splenic trunk) while left gastric artery arises

separately from abdominal aorta or remain absent.

Aims and Objectives: To observe numerical variations of the branches of celiac trunk.To observe the presence of any other branch from celiac trunk.

Materials and Methods: Approximately 98 cases were studied in the Department of Anatomy and Radiology, Subharti Medical College Meerut and Dr. O.P. Gupta Imaging Center Meerut. RESULT:- Various types of celiac trunk anatomic variations were identified in our study. Total cases observed 98.

Conclusion: CT Angiography is a safe and highly sensitive and accurate modality for evaluation of arterial anatomy and its variants.

Abs/19/06

STUDY OF VARIATIONS OF LOBES AND FISSURES IN ADULT HUMAN LUNGS.

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Introduction: Anomalous of lungs are uncommon and very interesting to study. These can be diagnosed and identified during surgery or by ultra sound,CT Scan, or by MRI.

Aims and objectives- Aim of the study that the objective of present study is to report the variations of lung regarding fissures and lobes in adult human lungs**.** Period of this study was done from 2017 to 2019 and this study was done in Department of Anatomy at Saraswati Medical College, Unnao, Uttar Pradesh.

Materials and Methods: Twenty six human lung specimens collected from the formalin fixed specimens from museum as well as from the routine dissection Department of Anatomy at Saraswati Medical College, Unnao, Uttar Pradesh. Each lung was examined for fissures and lobes and variations were noted. Later photos were taken and labeled.

Results: Out of twenty six lungs, only three lungs showed variations in fissures and lobes. One lung showed absence of both lobes and fissures.

Abs/19/07

CIRCLE OF WILLIS AND CONTRIBUTING VESSEL VANIATIONS: A CLINICO ANATOMICAL STUDY

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KCGMC, Karnal

Background: Circle of Willis anastomosing ring at the base of brain connecting internal carotid artery and basilar artery. Variations in the length and caliber of the vessels are important from the point of view that patients with ineffective collateral circulation in circle of Willis are more likely to develop stroke and transient ischaemic attacks as compared to patients with effective collateral circulation.

Objective: The aim of the present study is to find out the variations of circle of Willis and its contributing vessels

Methods: This study was carried out on variations of 60 brains obtained from the cadavers &Variations of the circle of Willis and contributing vessels were studied. The external diameters and symmetry of the vessels were noted from both anterior and posterior portions of circle of Willis.

Results: Typical complete and symmetrical circles of Willis were found in 46.1% of cases. Hypoplasia of posterior communicating artery was observed in 52.1% cases. Hypoplasia of posterior cerebral artery was present in 1.8% cases.

Conclusion: The variations are common in circle of Willis and these variations present an important role in the symptomatology, diagnosis and management of certain disorders that are caused by either obstruction or rupture of contributing vessels. Higher incidence of such variations could be a cause of premature strokes by occluding the particular vessel along with factors.

Abs/19/08

POLYMELIA-WITH SUPPRESSED ONE TWIN

Dr. D.N. Sinha

Introduction: Often we notice congenital anomalies and cases are also published in the newspapers for the public awareness and possibilities of their surgical corrections in the era of advancement of surgical practice for the survival of such cases.

Material: The boy was born with eight limbs four hands, two protruded from the abdominal wall, four legs of which one was clubbed foot. Three testes, two small intestine, but one kidney. Boy was otherwise healthy with normal brain. Subjected three surgical procedures. Boy had septal defect (VSD) and transposition of the great arteries.

Discussion and conclusion: Anomalies occurred during development could be multifactorial and genetic bound manifestations. Such type of anomalies are difficult to observe in vivo experiments. This case appears to be developing in a tendency of conjoined twin. However, one survived with the incorporation of genetic material of other resulted in Polymelia with the suppression of one kidney and three testes and two intestine. This genetic interaction also resulted in cardiac anomalies and transposition of the great vessels. However, the mechanism of this case would be speculative in the light of genetic display and its outcome.

Abs/19/09

NORTH INDIA BASED STUDY OF HISTOPATHOLOGICAL CHANGES IN GALLBLADDER OF CHOLELITHIASIS SPECIMENS

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Introduction: Gallbladder stone is a very common disorder of the gall bladder. This disorder is known to produce histopathological changes in the gallbladder. Gallstone is predisposing factor for the development of the malignancy of the gallbladder.

Materials and Methods: This retrospective study was conducted on 100 cases of cholecystectomy specimens. All the specimens were collected from the Surgery Department and fixed in 10% formaline.All the specimen were examine both macroscopically and microscopically to observe if there any changes.

Results: This study has shown higher incidence of stones in the gall bladder in 3rd and 4th decade of life. This study has been compare and correlated with available literatures.

Conclusion: During the process of formation of gallstone, there will be pathological changes in the epithelium of gallbladder that may play an important role.

Abs/19/10

VARIANT BRANCHING PATTERN OF HUMAN AORTIC ARCH: A CADAVERIC STUDY

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Introduction-The anatomical variations in the branching pattern of Aortic arch are significant for diagnostic and surgical procedures in the thorax and neck. The present study describes the Aortic arch branching pattern in cadavers and discuss the findings according to their embryological and clinical implications.

Material and Method-The study was conducted on fifty-two cadavers at the Department of Anatomy, Kalpana chawala government medical college, karnal ,India. The thoracic cavity was opened by cutting through the costochondral junctions and removing the sternum and costal cartilages. The lungs were removed, superior vena cava and brachiocephalic veins cleared, and pericardium opened to expose ascending aorta. Fibro fatty tissue and nerves were removed to clarify the branches of aortic arch and variations in branching pattern observed.

Result-In thirty-three (63.5%) cadavers, the aortic arch showed classical branching pattern which includes brachiocephalic trunk, left common carotid artery, and left subclavian artery. In nineteen (36.5%) cadavers it showed variations in the branching pattern, which include the two branches, namely, left subclavian artery and a common trunk in 19.2% cases, four branches, namely, brachiocephalic trunk, left common carotid artery, left vertebral artery, and left subclavian artery in 15.3% cases, and the three branches, namely, common trunk, left vertebral artery, and left subclavian artery in 1.9% cases.

Conclusion-The knowledge of such variations of great vessels is of vital interest to the surgeons because a minor accidental injury of the vessels cause sudden massive haemorhage.

Abs/19/11

LOWER RIGHT QUADRANT PAIN; A SONO ANATOMICAL PERSPECTIVE

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This study was done as a prospective study of sonographic evaluation of 133 patients with right lower quadrant pain/masses which includes patients of all age groups and both sexes. In this study the efficiency of ultrasonography over clinical assesment in determination of the organ of origin was evaluated in a systematic manner according to anatomy of the region. The maximum number of cases belonged gastrointestinal pathology (54%) followed by genitourinary pathologies (31.6%) and 14% cases belonged to non-Gastrointestinal (GI) non-Genitourinary (GU) origin. US has high diagnostic accuracy in diagnosing the pathological nature of RIF masses (over all accuracy-90%) while it is 100% accurate in case of appendicular mass, in detecting normal cases, normal variants(clinically diagnosed as RIF masses) , uterine mass, lymphnodal mass and ileocolic intussuception.

Abs/19/12

NORMAL DISTRIBUTION OF EVANS' INDEX IN HEALTHY NORTH INDIAN POPULATION: A COMPUTED TOMOGRAPHIC STUDY

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Introduction: As the human ages, there is a decrease in size of brain tissue, increase in cerebrospinal fluid volume and enlargement of ventricles. Brain ventricles can be studied by taking linear, planimetric or volumetric measurements. Linear ratios of the width of ventricles to the width of skull or brain are considered to be an easy and reproducible measurement for assessment of ventricles. One such linear ratio is Evans' index. It is the ratio of maximum width of frontal horns and maximum transverse internal diameter of skull in the same plane.

Aims & Objectives: The purpose of our study was to obtain a baseline data of reference values of Evans index in healthy north Indian population.

Material & Methods: This study was jointly conducted by Department of Anatomy and Department of Radiodiagnosis, King George's Medical University, Lucknow. 100 radiologically normal axial CT scans of head region of patients were thoroughly analyzed using Radiant DICOM Viewer Software. Study subjects were categorized into V groups as per age: 18-30years, 31-40years, 41-50years, 51-60years and above 60years. Evans' index was calculated.

Results: Evans'index ranged from 0.167 to 0.29 among study subjects with a mean value of 0.23±0.02. No significant association between age and mean Evans' Index ($p>0.05$) was observed. Mean Evans' index was equal for male and female and was not changing with age.

Conclusion: Study provides normal range of Evans' index and propose age dependent values of the same for healthy adult males and females which could be of use in routine radiological practice.

Abs/19/13

HISTOLOGICAL STUDY OF HUMAN FETAL THYMUS GLAND

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Introduction: The thymus is one of the primary lymphoid organs other than being the bone marrow. It is responsible for the provision of thymus-processed lymphocytes (T-lymphocytes) to the whole body. A cross sectional study is conducted to observe histological & developmental changes occurring in thymus gland at various gestational ages among human fetuses.

Aims & Objectives: The aim of present work is to study histological features of thymus gland at different gestational age group. Following point to be studied in relation with different gestational age group.

1. Differentiation of cortex and medulla.
2. Lobulation.

3. Appearance of Hassall's corpuscles.
4. Increasing no. of Hassall' corpuscles.
5. Vascularisation of lobes.

Materials & Methods: This study was carried on medically aborted & stillborn fetuses ranging from 12-38 weeks (n=31) obtained from Dr. Sushila Tiwari Memorial Hospital, Haldwani, (Uttarakhand) with due consent of parents and ethical committee, & preserved in 10% formalin. The human fetuses were categorized into 3 groups. Group1 - upto 12 weeks, Group2 - 13-24 weeks, Group-3 - 25-38 weeks. They were subjected to histological procedure as per protocol. Sections of 5microns thickness were stained with haematoxylin and eosin and examined under 10x and 40x magnifications using a Binocular microscope.

Results: In the present study normal micro architecture of thymus has been studied at various fetal ages in chronological order.

Conclusion: Thymus is responsible for the provision of the T-lymphocytes to the whole body in newborns and children until puberty. For this reason it is important to know the histology of the gland at different ages.

Abs/19/14

PALMAR DERMATOGLYPHIC: A FORECAST OF HEREDITARY DISEASES BY THE CUMULATIVE AND COMPARATIVE DATA IN EASTERN UTTAR PRADESH.

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Introduction: The study of ridges in the form of different designs as Loops, Whorls and Arches, various triangle, ridge counts as Total finger ridge count (TFRC) and Absolute finger ridge count (AFRC) etc. is called as Dermatoglyphics.

Aims and Objectives: This study is mainly focused on checking the validity and reliability of Dermatoglyphics for the prediction of various diseases which are mostly inherited like Bronchial Asthma, Essential Hypertension and Diabetes Mellitus. In this study the finger tip pattern like Loops, Whorls and Arches with Finger ridge count (FRC), TFRC and AFRC is included.

Material and Methods: The Study has been planned in Govt. Medical College, Azamgarh on 190 healthy individual, out of those 140 were male and 50 were female. The finger tip pattern of both hands was collected in the form of Loops, Whorls and Arches with FRC, TFRC and AFRC. The created data was statistically analyzed and compared with previous case-control study.

Results: It is been observed that there is no solid proof of Dermatoglyphic reliability because of unavailability of standard parameters (quality & quantity) of finger tip pattern, wide range of counts of patterns and Matching of present study results with both case and control of previous studies. Some studies was found important in which the count grading (from higher to lower) was changed from most normal results as Loops-Whorls-Arches to significant results as Whorls-Loops-Arches. The variability of results can also put a question on the inheritance of these diseases as it could be environment induced.

Conclusion: Our study conclude that Dermatoglyphics should not be used as a tool for prediction of disease because of high variability in results until the cytogenetic study of these inherited diseases doesn't show any specific parameter range of finger tip patterns in both aspects quality and quantity.

Abs/19/15

A CASE REPORT ON GALL STONE ILEUS

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Introduction: Gallstone ileus (GI) is an impaction of a gallstone within the gastrointestinal tract causing mechanical bowel obstruction. Patients with gallstone ileus may present with radiographic findings of Rigler's triad of pneumobilia, small-bowel obstruction and an ectopic gallstone. It results from a bilary-enteric fistula, and is a relatively rare presentation accounting for only 0.1% of mechanical bowel obstruction.

Case Report We present a 70 year female presented with features of Intestinal obstruction for 1 week. Ultrasound of abdomen revealed distended bowel loops and contracted gall bladder. Computerized tomography scan suggested contracted gall bladder with hyperdense contents with air foci in gall bladder and common bile duct with hypodense lesion in jejunal loop with air foci and calcifications causing luminal occlusion with dilated proximal bowel loop . After resuscitation, laparotomy was done which revealed a 3 cm stone impacted in jejunum 2 feet distal to DJ flexure with proximal dilatation of the jejunum. Enterotomy was done and stone was removed and bowel was decompressed. Primary closure of jejunum was done . The patient has been on follow up without any complaints for last 6 months.

Conclusion Gallstone ileus is perhaps the most diificult diagnosis as a cause of mechanical intestinal obstruction. It is often misdiagnosed and carries a significant rate of mortality and morbidity. Its danger reflects the advanced age of patients and the high incidence of severe concomitant diseases. Surgical treatment mandates removal of the stone via enterotomy. Whether to perform a cholecystectomy at the time of laparotomy remains controversial.

Abs/19/16

TO DETERMINATION THE GENDER IN LIVING ADULT MALE AND FEMALE SUBJECTS THROUGH MEASUREMENT OF STERNUM BONE IN AND AROUND THE LUCKNOW CITY

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Introduction: The gender determination from the skeletal remains is of very much interest in the field of medical science. Ashley GT -1956b formulated the 149 rule according to which a male sternum exceeded 149mm in length whereas the female sternum was less than 149mm. on the basis of previous researcher I have been planned to verify the existrnal data and establish them in reference to population in and around Lucknow.

Method: The measurements have been further use to calculate various sternal dimensions and indices according to the technique described by Ashley. Each linear measurement has been taken thrice on the anatomical position of the sternum using Mitutoyo-digital vernier calipers to the nearest millimeter with precision of 0.01 mm.

Result: The comparison of mean length of manubrium, mesosternum and sternum ranged from 40.39-71.31 mm, 83.49-129.97 mm and 150.21-170.39 mm respectively in adult male (16-60 yrs) where as in adult female ranged from 23.79-60.35 mm, 68.33-122.42 mm and 116.36-148.92 mm respectively.

Discussion: This study was fully supported the previous researchers, who have done the work in morphometry of sternum bone. According them sterna has distinguished in different zone of India, as well as it is shorter than European country.

Conclusion: it was determine that the male sternum is longer than female sternum. This conclusion will provide the help to distinguish factors for medico-legal studies where examination of human skeleton is obviously of greatest importance for identification purposes.

Abs/19/17

MORPHOLOGY AND MORPHOMETRIC ANALYSIS OF LINGULA IN DRY ADULT MANDIBLES

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Introduction: Lingula, also known as the Spix ossicle, is an important landmark for estimating the site of inferior alveolar nerve (IAN) block, given prior to surgical procedures on lower jaw. The failure rate of IAN block could be as high as 29 to 35 percent.

Aim and Objectives: To analyse the distances of lingula from the various landmarks to prevent failure of IAN block and to prevent injury to IAN in various surgical procedures. Material and Methods : Lingula was observed on 30 dry adult mandibles (60 sides) kept in the museum, for its shape and its distance from the anatomically palpable points such as, from point of maximum concavity on coronoid process(C), from the socket for third molar tooth (M), from head of mandible (H) and from angle of mandible(A). Descriptive statistics was analysed for each. Difference in right and left side was found by unpaired student t- test and finding the p-value at 5% significance level.

Results: The most common shape of lingula was triangular and the assimilated type was the least. The mean distance C, H, A were 16.22+/- 2.41mm, 28.42+/-2.62mm, and 17.32 +/- 2.33 mm respectively with no statistically significant difference between the sides. The average height of lingula was 8.4 +/- 1.09 mm.

Conclusion: Precise knowledge and assessment of position of lingula is must to avoid the complications in dental anaesthesia and mandibulofacial surgeries.

Abs/19/18

MYOCARDIAL BRIDGING AND ITS CLINICAL SIGNIFICANCE

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Objective-To study the myocardial bridging pattern in the course of anterior interventricular artery by cadaveric dissection and its clinical significance.

Materials and Methods- Heart specimens were collected from the department of forensic medicine, and department of anatomy of Institute of Medical Sciences, Banaras Hindu University.The preserve hearts were dissected by removing visceral pericardium and subepicardialfat.The leftcoronary arteries and their branches were dissected out with the help of blunt and fine forceps. The hearts with myocardial bridging in the course of left coronary artery and its branches were cleaned properly and were photographed.

Result- In our study, out of 40 dissected hearts we got eighteen cases (45%) of myocardial bridging, more commonly found in middle 1/3rd portion of left anterior interventricular artery.

Conclusion- The myocardial bridges are known risk factor for certain cardiac surgical interventions, particularly during aortic-coronary bypasses that affect the anterior interventricularartery and always there is a risk of perforation during the surgical manoeuvres.

Abs/19/19

MUCOCUTANEOUS JUNCTION OF HUMAN LIP: A LIGHT MICROSCOPIC STUDY

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Introduction: A mucocutaneous zone is of biological interest because of nature of contact between skin and mucous membrane.The red vermillion zone of the lip, consisting of the mucocutaneous junction that extends from the vermilion border anteriorly to the oral mucosa of the mouth posteriorly. It consists of thin keratinized stratified squamous epithelium. This region lacks salivary or sweat glands and is kept moist with saliva of tongue. Like skin epithelium it contains melanocytes with melanin pigment. Langerhans cells and Merkel cell are present in this zone.Dermatosurgery and esthetics surgery deals with surgical aspects of skin and its appendages. Knowledge of physical architecture of skin is of great importance in dermal grafting as well where success of grafting depends on matching skin from donor and recipient sites as in example cleft lip. Aims and Objective: To study the age specific and gender specific histological changes in the epithelium of lip on approaching muco-cutaneous junction.

Method: Samples of lip were collected at three different sites (upper lip, lower lip and commissure of lip, covering the total skin thickness including mucocutaneous junction andmucosa from the 8 frozen cadaver available at cold room of department of anatomy and the7 corpuses available from mortuary Of department of forensic medicine. Samples were labelled and further processed for tissue processing. They were stained with haematoxylin and eosin and PAS stains and further examined under microscope. Readings were taken using catymage software.

Result: The total thickness of skin of lip is higher in males than in females. However, the thickness of stratum corneum was more in females. Total epidermal thickness increases as we move from skin to mucosa in lip region. Number of Rete pegs are maximum in vermillion region of lip as compared to its skin and mucosa region.

Conclusion: Mucocutaneous region or vermilion of lip is identified by long rete ridges, long and numerous dermal papillae, thin dermis but thicker epidermis.

Abs/19/20

A CROSS SECTIONAL STUDY OF LONG BONE AND VERTEBRAL COLUMN IN MALEPATIENTS WITH HYPOTHYROIDISM

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Introduction*:* Osteoporosis and osteoporosis-related fractures are usually found related to postmenopausal females or elderly women, but these problems also occur in men. Thyroid disorders are among the leading causes of secondary osteoporosis. Untreated hypothyroidism has been associated with an increased bone mineral density (BMD) and an increased fracture risk. Thus, hypothyroidism is considered as a major risk factor for osteoporosis. As therelationship between hypothyroidism and bone healthhas been studied in very few studies in male population. The present study was aimed to investigate the association between hypothyroidism and bone health status in men aged 20 -60 yrs.

Aims and objectives: The main objective of this study was to evaluate the changes in long bone and vertebras due to decrease thyroid hormones.

Material and Methods*:* A total of fifty seven newly diagnosed male hyperthyroid patients and twenty fivemale euthyroid subjects were included in the current study. Thyroid hormones and vitamin D were estimated with ELISA method. Serum calcium was estimated by Arsenazo III method. Dual electron X-ray absorptiometry (DXA) technique was used to measure the BMD at the femoral neck and lumbar vertebrae.

Results: Results of the present study showed serum calcium level was significantly low in male hypothyroid patients (7.99±1.07 mg/dl) in comparison of male euthyroid subjects (8.8±0.79 mg/dl) with p value<0.001.serum vitamin D level was significantly lower in male euthyroid patients compare to male hypothyroid patients. (23.86±10.78ng/ml VS 51.82±17.66 ng/ml, p value<0.0001) and that BMD level at femoral neck and at lumbar vertebrae of male hypothyroid patients (0.981±0.11 g/cm2and0.974±0.11 g/cm2) was also high compare to male euthyroid subjects (0.941±0.092 g/cm^{2}and 0.939±0.10The p value was <0.05.

Conclusion: Findings of the current studysuggest that decreased level of thyroid hormones may interrupt the bone health of male subjects suffering with hypothyroidism as decrease level of thyroid hormones are associated with decrease level of serum calcium and decrease level of vitamin D. Moreover, higher level of BMD indicate the decrease in strength of vertebra and long bones which in turn increase the susceptibility of fracture in this population. Therefore, it is suggested that BMD, serum calcium and vitamin D should be evaluated especially in newly diagnosed hypothyroidism male patients to decrease the risk of fracture.

Abs/19/21

THE MORPHOMETRIC STUDY OF SEXUAL DIMORPHISM IN INDEX & RING FINGER LENGTH RATIO IN INDIAN POPULATION.

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Introduction: Anthropometry is a science which deals with method and techniques of measurement of living as well asskeletons of individuals. The morphometry of different parts of human body helps in personal identification and alsosexual dimorphism.

Aims and objective: To study the 2D:4D finger length ratio related with sexual dimorphism. To determine the body stature with height of an individual

Methods: Total number of students (200=Male & 200=Female) of age 17-25 years of Teerthanker Mahaveer University were examined for one year. With the help of Vernier caliper, the lengths of index and ring fingers were measured and then ratio was calculated in both the genders. The data was tabulated & mean & standard deviation was calculated. The paired t- test was used and P-value was calculated. P value < 0.05 was considered significant.

Results: The mean values of male population were found to be right 2D 7.04cm, right 4D 7.20cm, right 2D:4D ratio 0.97cm respectively, while in females the mean value were found to be right 2D 6.52cm, right 4D 6.72cm, right 2D:4D Ratio 0.96 cm respectively. Using t-test, in males and females the 2D:4D ratio was statistically insignificant for the right hand with p>0.05.

Conclusion: The anthropometric ratios help in establishing the gender and race of the individual, thus plays an important role in forensic science.

Abs/19/22

MORPHOMETRIC STUDY OF LOWER END OF DRY FEMUR IN NORTH INDIAN REGION AND ITS CLINICAL IMPLICATION

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Introduction: Lower end of femur is major component of knee joint. Accurate morphometric anatomical data of the lower end of femur and gender morphometric differences are very important to make design of total knee joint replacement and internal fixation material. Knee prosthesis made based on morphometric data of components of knee and according to gender will give better results in early mobility as well as fewer complications.

Aim: Present study was done to find out sexual dimorphism in lower end of femur as well as differences between morphometric data of lower end of femur between other populations of world and within India.

Materials and Methods: For the present study the material consisted of 120 dry femur of unknown gender were obtained from anatomy department, GSVM medical college, Kanpur. . Out of them 60 were of male (30 of right side and 30 of left side) and 60 were of female (30 of right side and 30 of left side). We have selected six metrical parameters 1. Bicondylar width (BCW), 2. Medial condylar anteroposterior distance (MCAPD), 3. Lateral condylar antero-posterior distance (LCAPD), 4. Medial condylar transverse distance (MCTD), 5. Lateral condylar transverse distance (LCTD) and 6. Intercondylar notch width (ICW) for the present study based on which the prosthesis for knee joint replacement surgery is made.

Results: All six parameters which are chosen are found significantly larger in male than females. The findings aresmaller than Caucasian population.

Conclusion: Present study provides data of measurement of lower end of femur by direct observation which will be useful to select correct prosthesis according to measurements. We have also provided data for gender wise and on right and left side which will improve the longitivity of prosthesis, increased mobility and lifestyle of patient after knee replacement surgery.

Abs/19/23

COMPARATIVE MORPHOMETRIC STUDY OF NUTRIENT FORAMEN IN HOMOLOGOUS LONG BONES ULNA & FIBULA

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Introduction: Nutrient foramen is an opening into the bone shaft which gives passage to nutrient artery.Nutrient artery is principal source of blood to a long bone during the growing period and early phase of ossification.Nutrient foramina reflects bone vascularization, thus the knowlwdge of number, position, location and direction of these foramina is useful in orthopaedic surgical procedure,s like joint replacement, fracture repair and vascularised bone grafts.

Aims & Objective: Fibula is most commonly used for bone graft purpses. Ulna being homologous to fibula, the present study aims to compare ulna and fibula with respect to morphology and topography of diaphysial nutrient foramen.

Material & Methods: This study was conducted in Department of Anatomy, GSVM Medical College, Kanpur. 100(50 right &50 left) ulna and fibula were examined for number, position, location and direction of Nutrient Foramen. Foramina Index was calculated.

Result: 93%of ulna showed single nutrient foamen, 100% were present on anterior surface with the mean foramina index of 33.87+3.49 whereas 78% of fibula showed single nutrient foramen,97.5% foramen were present on posterior surface with mean foramina index of 45.86+4.55.

Conclusion: The present study exhibited higher percentage of single nutrient foramen in both ulna and fibula, also they were positioned mostly on the flexor surface of middle one third of shaft of both the bnones. Thus, it was an attempt to draw a parallell between Ulna and Fibula for use as vascularised bone grafts.

Abs/19/24

STUDY OF OCCURRENCE OF CONGENITAL VERTICAL TALUS (CVT) IN FOOT IN CHILDREN OF JHARKHAND STATE

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Introduction: CVT is a rigid flat foot deformity characterized by fixed hind foot equinus and an irreducible talonavicular dislocation. It presents as a rigid flat foot with a rocker bottom appearance of foot.

Aim & Objective: To study the occurrence of CVT in foot in paediatric patients of tribal & non- tribal origin of Jharkhand state

Material & Method: 50 paediatric patients coming to the OPD/ admitted inDeptt. of Orthopedics of RIMS were considered for present study. Parents /guardians were requested to sign consent form. The study was done by Clinical & Radiological assessment.

Result: 2cases of CVT were observed which were bilateral and Male:Female ratio being 1:1.

Conclusion: Thus early diagnoses of CVT will lead to early treatment which will be useful in preventing disability in later life.

Abs/19/25

STUDY OF ALIGNMENT OF INFRAORBITAL FORAMEN (IOF) WITH MAXILLARY TOOTH IN DRY HUMAN SKULLS OF NORTH INDIAN POPULATION

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Introduction : IOF is a constant feature on the anterior surface of body of maxilla below the orbital margin .Infraorbital nerve(ION) & vessels pass through it .IOF assumes great importance in the field of Maxillo- facial surgery & dentistry as ION is anaesthetised during these procedures.

Aim & Objective: Maxillary tooth is readily visible and palpable landmark. It can be highly helpful in locating IOF. Hence a study was conducted to determine alignment of IOF with maxillary tooth.

Material & Method: The study was conducted in Deptt. of Anatomy, GSVM Medical College, Kanpur. 300 macerated dry adult human skulls of North Indian population belonging to both sexes were selected .The skull was placed in Frankfurt plane. Alignment of IOF with maxillary tooth was noted by suspending a needle with thread from the center of IOF & determining the position of its tip.

Result: The present study found that IOF was in same line with 2nd pre-molar in 90.67% of skulls. **Conclusion:** Thus knowledge of alignment of IOF with maxillary tooth helps in locating its position.

Abs/19/26

AN ULTRASONOGRAPHIC STUDY TO EVALUATE CORRELATION OF CALCIFIED YOLK SAC WITH SPONTANEOUS ABORTION

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Introduction: Sonography shows the yolk sac as a round structure that is made up of an anechoic center bordered by a regular well-defined echogenic rim**.** The diameter of a yolk sac is usually 3-4 mm and increases in size up to the 10th week of gestation and attains it maximum diameter at 10 weeks after which it's size starts decreasing and it disappears at 12 weeks.

Aims & Objectives: To identify the calcified yolk sac in the first trimester singleton pregnancy (6- 12 weeks) and to evaluate its correlation with spontaneous abortion.

Material and Methods: The study was carried out in the Department of Anatomy in collaboration with the Department of Radiodiagnosis. 144 pregnant females were sonographed transvaginally (TVS) in their first trimester, in the Department of Radiodiagnosis referred by

Department of Obstetrics and Gynaecology. Normal and calcified yolk sacs were identified and their correlation with spontaneous abortion was evaluated by follow up.

Results: Out of 144, yolk sac was present in 140 cases (97.22%) and in 4 cases (2.78%), it was absent. Out of 140, in 2 cases the yolk sac was calcified. Normal yolk sac was found in rest of the cases (98.57%), all continued as normal pregnancies and both the calcified yolk sacs culminated into spontaneous abortion. The p-value came out to be significant (< 0.001).

Conclusion: The appearance of the yolk sac is of significant clinical use in the evaluation of early pregnancy, therefore its normal appearance should routinely precede visualization of the embryo.

Abs/19/27

ANTHROPOMETRIC ASSESSMENT OF ADULT HUMAN AURICLE IN NORTH INDIAN POPULATION

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Introduction: Knowledge of measurements of auricle is important, as lot of variations exist in morphometry of auricle between various age groups and races. This study gains importance in many areas like Forensic Medicine, Anthropology, Acupuncture and Aesthetics.

Aims: To measure the length of auricle of both right and left ear and lobule width of right and left ear in North Indian population.

Material and Methods: This study was conducted on 130 subjects (78 males and 52 females), in the age group of 18 to 25 years, without history of genetic disorders, injuries or any other disease of the auricle.

Results: The average length of the auricle was 6.28 mm (right) and 6.23 mm (left), and average width was 3.31 mm on right side and 3.28 mm on left side. The average height of the lobule was 1.76 mm on right side and 1.77 mm on left side while the lobule width was 1.90 mm on right side and 2.01 mm on left side.

Conclusion: Our study aims to find the mean values of different morphometric measurements of right and left auricle in North Indian population, which can be utilized in making of hearing aids, in various ear reconstructive surgeries and in identification of a person.

Abs/19/28

RELATION BETWEEN 2D:4D RATIO AND BREAST CANCER IN FEMALES

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Introduction: Breast cancer is the most common cancer among women in India followed by cervical cancer. It is a major threat to women today with nearly half a million deaths attributed to it, mainly due to the lack of early diagnosis and treatment. A finger length ratio determination is genetic but it has been reported to be affected by the environmental and chemicals factors in the first trimester of pregnancy. Importance of finger length ratio in modern world is not restricted to the field of forensic significance and sex determination only. Several anthropological studies have found sex differences in 2D:4D ratio, with man having lower average 2D:4D ratio than women.

Aim and Objective: The aims of this study is to assess the relation of 2D:4D ratio among women with breast cancer and control groups.

Material and Methods: The study was conducted on 145 histopathological diagnosed breast cancer women and their finger length ratio, compared with 145 normal healthy women with no family history of breast cancer. Digit length was measured by the digital Vernier caliper with a resolution of

0.01 mm.

Results: In present study (2D:4D) Ratio is highly statistically significant in effected case - group as compared to the control group where p value of 2D:4D ratio is less than 1. Higher 2D:4D ratio is significantly associated with breast cancer. 2D:4D ratio in left hand is higher than the right hand in breast cancer females.

Conclusion: According to present study, finger length ratio may help in identifying women with risk of breast cancer in their future. This study can also be used as a screening tool for the women with high risk of breast cancer.

Abs/19/29

STUDY OF OCCURRENCE OF ACCESSORY MANDIBULAR FORAMINA AND THEIR POSITIONAL VARIATION IN DRY MANDIBLE.

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Introduction: The inferior alveolar nerve injection is one of the most commonly administered injections in the field of dentistry. Practitioners use intraoral anatomical landmarks, which may vary greatly among patient.The objective is to assist practitioners by identifying a range of variability within the landmark used for inferior alveolar nerve anaesthesia.

Aim and Objective: To study the position of accessory foramina to help dental surgeons to avoid iatrogenic injuries to inferior alveolar nerve and vessels.

Material and method: 54 dry mandibles of unknown sexes were included in the study from the department of Anatomy,Motilal nehru medical college, Prayagraj. Accesory foramina were noted.The broken mandibles were excluded from the study.

Result: Accessory foramina were found in 34%, 14%on the right side,12%on the left side ,5%on both sides of medial surface of mandibles.Retromolar foramina were noted in 4% of mandibles.

Conclusion: With the precise idea of position of accessory foramina, iatrogenic injuries of inferior alveolar nerve and vessels can be better avoided and ease the work of dental surgeons.

Abs/19/30

MORPHOMETRIC STUDY OF MAXILLARY SINUSES IN NORMAL SUBJECTS BY USING COMPUTED TOMOGRAPHIC IMAGES.

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Introduction: Morphometric knowledge of male and female maxillary sinus has significancant role during conducting endoscopic sinus surgery and determination of sex of the individuals.

Aim: The aim of our studdy is to estimate bilateral different Parameters of maxillary sinus [i.e. Antero-posterior diameter (APD), Transverse diameter (TD), Craniocaudal diameter (CCD] in 67 normal subjects by CT (Computted tomography) .

Materials and Methods: Cranial computted tomographic images of 67 normal subjects between the age groups of 21 to 70 years were taken in our study. The APD, TD, and CC of the maxillary sinuses were measured with help of computted tomography machine. The statistical analysis for sex and age comparison for all the parameters was done.

Results: The mean Antero-posterior diameter, Transverse diameter and Craniocaudal diameter of Maxillary sinuses in males of both right and left side are 3.61 cm, 2.30cm,3.32 and 3.56cm, 2.26cm, 3.38cm and and in females are 3.26 cm, 2.05 cm, 3.14cm and 3.18cm, 1.97cm,2.92cm.

Conclusion: The current study of CT guided morphometry of maxillary sinuses may be helpful for the ENT surgeons during performing the endoscopic sinusurgery and also support to gender determination.

Abs/19/31

MAJOR CONGENITAL ANOMALIES ASSOCIATED WITH DOWN'S SYNDROME IN NORTH INDIAN POPULATION

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Introduction: Down syndrome is the most common genetic cause of intellectual disability in the population whichoccurs due to an additional chromosome 21 or a partial trisomy, mainly in the 21q22 region. This leads to its clinical manifestations and involves various systemic defects such as mental insufficiency, congenital cardiac anomalies, ophthalmic disorders, genital abnormalities and others.

Aims and Objectives: To observe the major congenital anomalies associated with Down's syndrome in North Indian population.

Material and Method: For the present study, peripheral blood samples were collected from 50 suspected patients of DS, of age group 0-10 years who were screened in Pediatrics Department, KGMU. Informed consent was taken from their parents/ guardians and while collecting samples, detailed personal history, family history and thorough clinical examination was done.The study was conducted in the cytogenetic laboratory of the Department of Anatomy, King George's Medical University U.P, Lucknow. Karyograms were prepared and evaluation was done.

Result: Of all the cases of DS, 92.3% patients were found to be associated with at least one major anomaly. The most common types of anomalies were cardiac anomalies (69%), ASD being most common (33.3%) followed by CNS anomalies (53.8%), GIT anomalies (23.1%), urinary system anomalies (23.1%) and facial anomalies (23.1%). In this study least common type of anomalies seen were musculoskeletal anomalies (7.7%).

Conclusion: Most of the cases of DS are associated with at least one major anomaly, cardiac anomalies being most common. The associated malformations underscore the need for thorough evaluation and a multi disciplinary approach for treating these complicated cases of DS.

Abs/19/32

ACCESORY LIVER LOBE ATTACHED TO THE GALL BLADDER WALL : A CASE REPORT

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Introduction: An accessory liver lobe is a rare developmental abnormality, which is often not diagnosed preoperatively, and is usually detected incidentally during abdominal surgery. This condition is often asymptomatic; here, we report on a case where accesory lobe was diagnosed during laproscopic cholecystectomy.

Case Report: A 30 yr old woman presented to Sir Sunderlal Hospital, BHU with right upper abdominal pain. An abdominal ultrasonography indicated cholelithiasis. She underwent laparoscopic cholecystectomy during which an accessory liver lobe attached to gall bladder was found.

Conclusion: An accessory liver lobe can occasionally result in complications, such as bleeding, portal vein obstruction or malignant transformation to hepatocellular carcinoma. Thus it should be resected to prevent complications.

Abs/19/33

VARIATIONS OF AXILLARY ARTERY IN RELATIONSHIP WITH BRACHIAL PLEXUS: A CASE REPORT

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Introduction: Variations in the formation, course and distribution of brachial plexus are common and are well documented, but the variation of the cords of brachial plexus in relation to axillary artery is rarely documented. Knowledge of these is important to Anatomist, Radiologist, Anaesthesiologist and plastic and vascular surgeon.

Case Report: On routine dissection of an embalmed 64 years old male cadaver, variations were found in the formation of median nerve from lateral and medial cord of brachial plexus bilaterally. On the left side the median nerve received double contribution from lateral cord, in which one cord attached proximally 1.5cm distal and anterior to the second part of axillary artery and second cord attached 11.5cm distal to the proximal contribution of median nerve, lying posterior and medial to the axillary and brachial artery. On the right side median nerve received single contribution from lateral cord of brachial plexus and it was present medial and posterior to the axillary and brachial artery. The variations of third part of axillary artery were also found. The posterior circumflex humeral artery, circumflex scapular artery and thoraco dorsal artery arise from common sub scapular trunk of axillary artery bilaterally.

Conclusion: The probable cause for such variations and their embryological basis is discussed in the paper. Although these variations may not have affect the functioning of upper limb. Knowledge of such variations is essential in evaluation of unexplained sensory and motor loss after trauma and surgical interventions.

Abs/19/34

A RADIOLOGICAL STUDY ON THE TRABECULAR PATTERN IN UPPER END OF FEMUR AND IT'S CORRELATION WITH SERUM VITAMIN D LEVELS IN POSTMENOPAUSAL WOMEN

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Introduction: Osteoporosis is a worldwide medical abnormality affecting older populations, especially women. It is a major health problem characterised by low bone mineral density and a reduction in bone strength.

Aims & Objectives: The aim of the study is to identify the trabecular pattern radiographically in the upper end of femur by Singh index & to correlate it with the values of vitamin D & its influence of age in post menopausal women.

Material & Methods: The study was conducted on 90 pelvis radiographs of post menopausal women who was age between 45-60 years in the department of radiology, SGT Medical College Gurugram. Baseline values are recorded for all women, including age, weight, height. To determine the trabecular pattern by Singh index, the AP radiographs of the pelvic region including hip joint was taken at a distance of 100 cm in neutral flexion, abduction & 15 degrees of internal rotation. 5ml of blood was withdrawn under aseptic conditions for estimation of serum vitamin D. Karl Spearman's & Pearson correlation coefficient was used to analyze the parameters under study.

Results: We determine that the Singh index is significantly correlated with values of serum Vitamin D ($p<0.032$) & age is also significantly correlated with the vitamin D levels ($p<0.001$). The evaluation of the Singh index grades in its self, there was a significant relation among them.

Conclusion: On the basis of our findings we found that the Singh index has significant Correlation with vitamin D levels in assessing the grade of osteoporosis.

Abs/19/35

A STUDY OF NON-METRIC VARIATION OF THE NECK OF THE FEMUR

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Introduction: Femoroacetabular impingement arises as a result of abnormal morphological features involving the proximal femur (cam type) or the acetabulum (pincer type). Repetitive micro trauma from impingement of the femoral neck against the acetabular rim is the cause of many cases of idiopathic osteoarthritis of the hip. Femoroacetabular impingement is often associated with an osseous bump deformity on the femoral head-neck junction.

Aims & Objectives: Present study was taken to find out non -metric variations of neck of femur which may cause femoroacetabular impingement (cam type).

Material & Methods: Total of 200 femora of unknown age and sex collected from bone room of Anatomy Department of Motilal Nehru Medical College Allahabad (U.P.). These femora were examined for the non-metric variations of the neck of the femur like Cervical fossa of allen, Poirier's facet, Plaque formation.

Result: 200 femora were study out of which Cervical fossa of allen were found in 11.5% femora, Poirier's fossa were found in 23.5% femora, Plaque formation were found in 36% femora.

Conclusion: Study will be helpful to orthopaedic surgeons, radiologists, anthropologists, anatomists to understand and mange the mechanics of hip joint, cam type of femoroacetabular impingement and osteoarthritis of hip joint.

Abs/19/36

A COMPARATIVE STUDY OF PLACENTAL MORPHOMETRY IN DIABETIC AND NORMAL GRAVIDAS

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Introduction: The placenta plays a key role in sustaining fetal growth and development. Due to its position between mother and fetus, it is exposed to changes in the intrauterine environment in both (maternal as well as fetal) circulations.

Aim: To investigate and compare the placental morphometry in diabetic and normal pregnancies.

Material and methods: A prospective observational study was carried out on 70 placenta in the Department of Anatomy, King George's Medical University UP, Lucknow. Thereafter morphometric measurements of the placenta were taken. The mean and standard deviation of parameters were calculated.

Results: In Diabetic pregnancy, placental weight, diameter, thickness, cotyledons and fetal weight were found to be more than control group while decrease in placental volume was found to be statistically insignificant. These findings support the hypothesis that impaired placental function is one of the main reasons for the increased frequency of fetal complications in diabetic pregnancies. Increased placental morphometric parameters of diabetic mothers may be associated with impaired functioning, leading to increase fetal weight due to compensatory mechanism. Thus, placental examination is of critical value in improving the management in subsequent gestations.

Conclusion: An adequate knowledge of the placental morphometry is valuable in the early assessment of the fetal well being, especially in a community like ours, where antenatal mothers still come unbooked to the labour room, with no prior investigations done.

Abs/19/37

UNILATERAL UNUSUAL VARIATION OF MUSCULOCUTANEOUS NERVES

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Introduction: The distribution, course & branching of the Musculocutaneous nerve is important from the clinical point of view. However a good knowledge of nerve pathways &their variation is very important for surgeons in post traumatic evaluations, exploratory interventions &administration of neuromuscular blocks in axillary region.

Presentation of case: This report explains a case of variation of musculocutaneous nerve which was observed in male cadaver

during educational gross anatomy dissection of the axilla in our laboratory.

Discussion & Conclusion: The musculocutaneous nerve usually arises from the lateral cord of the brachial plexus, pierces & innervates the coracobrachialis muscles. But here the musculocutaneous nerve communicate with median nerve without piercing & innervations of coracobrachialis. This variation should be considered when a high median nerve paralysis exist in the axilla.

Abs/19/38

FETAL ABDOMINAL CIRCUMFERENCE AN ULTRASONOGRAPHIC STUDY FOR FETAL GESTATIONAL AGE IN LAST 2 TRIMESTERS.

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Fetal Biometry considers measuring several parts of fetal anatomy and their growth. Predictions based upon menstrual history, uterine fundal height and bimanual examination have been in use since a long time but even in the best known cases these techniques have met with errors. Several ultrasound based parameters have been studied time to time to access fetal age and growth. In the present study we have used Fetal Abdominal Circumference (AC) as a parameter.

During ultrasonography, the Abdominal Circumference was measured on the transverse image of the fetus at the level of liver. The fetal abdominal circumference was measured at the position where its transverse-diameter was the greatest. This was determined sonographically as the position where the right and left portal veins were continuous with one another.A major landmark was the umbilical portion of left portal vein deep in the liver. Fetal stomach bubble and maximum length of Gall Bladder represented other landmarks. The measurements were made from outer edge of one side to outer edge of other side.

The Present study was carried out in Department Of Anatomy of S. N. Medical College, Agra in collaboration with Departments of Radiodiagnosis and Obstetrics and Gynaecology. 50 cases of normal pregnant females attending the Out Patient Department were studied of which 25 cases were of second and third trimesters each and their Abdominal Circumferences (AC) were measured. Mean Abdominal Circumference (in mm) in present study was lower than Hadlock's table in every week of both trimesters. Maximum difference observed was 14 mm (9%) in 2nd trimester (Fig.-11) which increased to 20 mm (7%) in 3rd trimester.

Abs/19/39

FETAL HEAD CIRCUMFERENCE AN ULTRASONOGRAPHIC STUDY FOR FETAL GESTATIONAL AGE IN LAST 2 TRIMESTERS.

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S. N. Medical College, Agra

Fetal Biometry considers measuring several parts of fetal anatomy and their growth. Predictions based upon menstrual history, uterine fundal height and bimanual examination have been in use since a long time but even in the best known cases these techniques have met with errors. Several ultrasound based parameters have been studied time to time to access fetal age and growth. In the present study we have used Fetal Head Circumference (HC) as a parameter.

During ultrasonography, the fetal HC was measured by positioning the cursors on the outer edges of near and far calvarial walls. The correct plane of section was through 3rd ventricle and thalmi in central portion of brain. The cavum septi pellucidi were visible in posterior portion of brain. The Present study was carried out in Department Of Anatomy of S. N. Medical College, Agra in collaboration with Departments of Radiodiagnosis and Obstetrics and Gynaecology. 50 cases of normal pregnant females attending the Out Patient Department were studied of which 25 cases were of second and third trimesters each and their Head Circumferences (HC) were measured. An average reduction of 5.5 % in 2nd trimester and 24 % in 3rd trimester was found in HC's of West U.P. region in comparision to Hadlock's normograms comprising of Western Data for fetal Head Circumference

Abs/19/40

A STUDY OF CHANGES IN TRANSVERSE PROCESS AND FORAMEN TRANSVERSARIUM IN COURSE OF OCCIPITALIZATION OF THE ATLAS VERTEBRA

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Introduction: The vertebrate skull is the most modified part of the axial skeleton. The very size of the human brain emphasizes the skulls cerebral function. The first cervical vertebra is called the atlas. The arches give the atlas a ring like appearance. A large transverse process, pierced by a foramen transversarium, projects laterally from the lateral mass.

Material and Methods: The present study is based on the observation of 1220 skulls belonging to Northern State of India, present in the Anthropology Museum of Department of Anatomy, G.S.V.M. Medical College, Kanpur & S.N.Medical College, Agra. The macerated skulls were randomly selected. The age and sex of the skulls were not taken into consideration.

Results: In our study, we find in case of occipitalization of atlas vertebra transverse process & foramen transversarium was bilaterally complete in 50% skull, right side transverse process & foramen transversarium was complete in 5%, left side transverse process & foramen trasversarium was complete in 5%, bilaterally incomplete transverse process in 30% & foramen transversarium in 40% skull, transverse process was absent in right side in 5% skull & left side in 5% skull.

Conclusion: Present study shows variation in status of transverse process & foramen transversarium with occipitalization of atlas vertebra.

Abs/19/41

A STUDY TO DETERMINE THE DOMINANCE OF CORONARY ARTERIES BY POSTERIOR INTERVENTRICULAR ARTERY IN ADULT HUMAN HEART BY CAST METHOD

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Fifty specimens of adult human hearts were collected from S.N.Medical College, agra and fixed in 10% formalin solution and then cannulated and flushed with dilute H202 to flush out clots and then10-15 ml of red and blue colouredresin casting solution injected

in right and left coronary arteries respectively and kept in oven at 60 degree overnight for complete polymerization and setting. Then maceration of heart tissue done with 5% KOH solution for 2 days and then macerated heart tissue washed away by running water and casts obtained were preserved in glycerine and observations were taken.

In this study, it was found that Posterior interventricular artery (PIVA) arose from (RCA) Right Coronary artery in 82% of specimens and from Left coronary artery (LCA) in 18% of specimens. It was also seen that in 36% cases, PIVA of RCA terminated 3/4th way down posterior interventricular septum (PIVS) while in case of LCA, it was only 4% cases. It was also noted that termination of PIVA at apex in RCA was 12% cases while in LCA, 8% specimens terminated at apex.

Abs/19/42

VARIATIONS IN THE FORMATION OF MEDIAN NERVE IN EMBALMED ADULT CADAVERS

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Introduction: Variation in the origin and distribution of branches of brachial plexus are common but variation in roots, trunks and cords are very rare.

Aim Of Study: To describe brachial plexus variation in the formation of median nerve

Materials and Methods: 25 embalmed adult cadavers were dissected and the brachial plexuses were evaluated in the Department of Anatomy, JJMMC, Davangere

Results: During routine dissection of 50 upper limbs,we observed the variation in the formation of median nerve in 10 cases.Out of 50 specimens,lateral root of median nerve arising from lateral cord was found single in 41 specimens(82%),two in number in 8 specimens(16%) and three in number in only one specimen(2%)..

Conclusion: The variations of the cords of brachial plexus and its terminal branches become important during surgical exploration of the axilla to avoid damage to important nerves. The details of the study will be discussed at the time of presentation.

Abs/19/43

CLINICAL ANATOMY-NEED OF HOUR

Brijendra Singh, Karishma Sharma, Mathew Joseph, Rashmi Malhotra, Kumar Satish Ravi

AIIMS, Rishikesh

"In certain liver and gall bladder pathology pain is generally felt at the top of right shoulder. The right phrenic nerve send branch to liver. Third cervical nerve, from which the phrenic nerve arises also send branches to shoulder. Thus a neural connection between liver and shoulder is established".

Without the knowledge of Anatomy of these regions, such a clinical diagnosis wouldn't have been reached. Hence, a well-trained physician who has a sound knowledge of anatomy can make a differential diagnosis of liver pathology even in the case of shoulder pain. "Eyes see what mind knows ". The above mentioned was one among thousands of anatomical basis of clinical diagnosis. Here comes the role of the knowledge of clinical anatomy to play. Clinical Anatomy is must to know fundamental Anatomy as a part of problem based learning and problem solving skill which is taught to students at all levels live MBBS, B.Sc. Nursing and paramedical from day one at AIIMS Rishikesh. Osteology, Radiology and orthopedic with clinical problems and solutions is also an integral part. Post graduates and post doc students are encouraged to develop their skill on cadaveric dissection as well as virtual dissection on surgical planning platform in clinical skill lab of anatomy.

This type of clinical anatomy teaching /learning will give due importance and respect to Anatomy so that Anatomy will become once again a key stone to medical education and medical practice.

Abs/19/44

AN ANATOMICAL STUDY ON FORAMEN VESALIUS AND CANALICULUS INNOMINATUS

Dr. Monika Srivastava

Saifai

Introduction: The greater wing of sphenoid bone contains three consistent foramina. The consistent foramina are Foramen Ovale, Foramen Rotundum and Foramen Spinosum.Inconsistent foramina are Foramen Vesalius and Canaliculus Innominat us may be present.

Objective: To investigates the presence and absence of Foramen Vesalius and Canaliculus Innominatus in dry human skulls. To study the location and frequency of both foramina.

Material and Method: We studied 30 human skulls available in the Department of Anatomy, UP University of Medical Sciences, Saifai, Etawah. These skulls were the part of boneset obtained as a part of undergraduate training in the department.We examined skull B/L both from ext and int aspects.

Result: In the present study three skulls reported to have Foramen Vesalius and two skulls have Canaliculus Innominatus out of thirty skulls. Two skulls out of three skulls contained Foramen Vesalius on right side only and one skull has both sides. Two skulls have Canaliculus Innominatus in which one has bilateral presentation and one has single opening on right side.

Conclusion: Knowledge about the characteristics of Foramen Vesalius and Canaliculus Innominatus and its frequency is not only important for anatomist but equally essential for clinicians who approach middle cranial cavity for various procedures.

Post/19/01

POSTER PRESENTATION

A STUDY OF PONTICULUS POSTERIOR OF ATLAS: INCIDENCE AND CLINICAL CORRELATIONS

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Introduction: The posterior ponticulus or foramen arcualeis caused due to ossification of the connective tissue around the vertebral artery (VA). Formation of a complete foramen may disturb normal functioning of VA.

Aims and Objectives: The study was done to investigate the incidence of ponticulus posticus in dry atlas vertebrae

Material and methods: 50 dry human atlas vertebrae were examined from the bone collections in Dr RML Institute of Medical

Sciences**,** Era's Lucknow medical college and Saraswati Dental College, Lucknow. The presence of ponticulus posticus was looked for and documented with photographs.

Results: The presence of this accessory foramen on the dorsal arch was the only anomaly found in these vertebra.The study showed the presence of a unilateral foramen with an incidence of 6%.

Conclusion: The study provides evidence about the incidence of ponticulus posticus in the North Indian population. The clinicians should be aware of the possibility of this foramen in patients complaining of headache, vertigo and vertebrobasiliar insufficiency.

Post /19/02

ANATOMIC VARIATION OF ANTERIOR ROTATOR CUFF : A CASE REPORT

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Indication: The rotator cuff, muscles protects the glenohumeral joint and gives it stability, The subscapularis is a thick, tringular muscle that lies on the costal surface of the scapula, It crosses the anterior aspect of the scapalohumeral joint on its way to the humerus. It joins the other rotator cuff muscles in holding the haed of the humerus in the glenoid cavity all movements of the glenohumeral joint, A number of accessory muscle slips connected with the SM have been reported as variation of Subscapularis muscle

Case Report: During the routine undergraduate dissection classes, we came across unusual muscle fibers of Subscapularis muscle on the anterior rotator cuff in a male cadaver. The muscle had the normal multipennate arrangement in subscapular fossa, traingular in shape, In the lower part of axilla, major portion of subscapularis muscle lay below the axillary nerve but a small sized muscle fasciculus having the same origin passing anteriorly to the axillary never was noted. Later in coalesced with the rest of the muscle fiber & forms anterior rotator cuff.

Conclusion: Rotator cuff tear is very common and knowledge of subscapularis muscle fiber arrangement is clinically important as it is frequently involve in the chronic tears. The variant muscle fasciculus has patient to compress axillary nerve leading to axillary nerve palsy, Symptoms include weakness of deltoid musule atrophy of teres minor, paresthesias in the lateral shoulder and dull aching in posterior shoulder typically present with the arm in an overhead position.

Post /19/03

STUDY OF VARIATION IN SUPRASCAPULAR NOTCH AND ITS CLINICAL IMPLICATIONS

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Introduction: Scapula is a flat triangular bone, lies on the posterolateral aspect of thoracic cage against 2nd to 7th ribs. Superior border is the shortest border and mostly have a notch on its lateral side near the coracoid process. A flat superior transverse ligament attaches the base of coracoids process to the medial limit of the notch and convert the notch into a foramen. The suprascapular nerve passes through this foramen to supply the supraspinatus and infraspinatus muscle. Sometime the superior transverse ligament get ossified and convert the notch in to foramen which may cause suprascapluar neuropathy.

Aims & Objectives: The shape of the suprascapular notch is one of the important predisposing factor for the suprascapular nerve entrapment and this condition is more commonly seen in athletes. **Material and Methods:** The present study was carried out in the Department of Anatomy of Government Medical College, Pali and AIIMS Jodhpur among 147 dried scapulae, irrespective of age and sex.

Result: A total 147 scapulae were analysed for suprascapular notch variations. We found total 6 types of suprascapular notch according to their shape. Type IV notch were the most common (31.04%), then type I (23.80%), type III (21.76%), type II (14.28%), type VI (2.04%) and least common was type V which was 1.36% only.

Conclusion: Study of variation in morphology of suprascapular notch and the ossification of supracsapular ligament plays an important role to understand suprascapular nerve entrapment syndrome.

Post /19/04

ADRENAL MYELOLIPOMA MIMICS ECTOPIC ADRENAL OR RENAL TISSUE: AN INCIDENTAL FINDING DURING CADAVERIC DISSECTION

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Department of Anatomy[1] and Pathology[2], AIIMS Patna

Introduction: A rare, non- functional, benign neoplasm affecting adrenal gland with a picture of mature adipose tissue and scattered islands of hematopoietic elements pushing the normal adrenal cortex aside is termed as adrenal myelolipoma (AML) or adrenomylolipoma.

Case report: Here, a case of an incidental finding of AML during cadaveric dissection is presented which on naked eye examination was appearing to be an ectopic adrenal or renal tissue, based on the similarity to their external texture. This warranted a histological examination, which presented a thin rim of adrenocortical tissue, surrounding the mature adipose tissue, and attenuated under the pressure exerted by the mass, also islets of myeloid, erythroid and megakaryocytic cell lines in varying proportions, resembling the mature bone marrow morphology. The review of PubMed based literature explains similar incidental post-mortem autopsy findings due to the asymptomatic nature of the tumour.The incidence of AML varied between 0.08% and 0.2% in the last decade of 20th century, which increasedup to 10 15% of incidental adrenal masses due to widespread use of non-invasive imaging modalities leading to increase in diagnosis of the pathology.

Conclusion: Before considering any ectopic adrenal or renal tissue during cadaveric dissection, histo-pathological examination is mandatory for confirmation and this adreno-myolipoma is asymptomatic post- mortem finding in10-15% of cases of adrenal tissue which mimics ectopic adrenal gland or renal tissue due to its external texture.

Post /19/05

CASE REPORT-TOTAL-SPINA-BIFIDA-OCCULTA OF SACRUM

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Department Of Anatomy UPUMS Saifai, Etawah

Introduction- Spina-Bifida Occulta is a condition in which there is incomplete dorsal midline closure of the osseous tissue, thus spinal

cord remains unprotected. It is classified into four types Type-1(1.4%) with completely open sacral canal, Type-II (2.1%) below S1 down to S5, Type-III (22.1%) below S2 down to S5, Type IV (33.6%) below S3 down to S5 and Type-V S1 (1.4%) to S2 open with normal sacral hiatus at the apex of sacrum.

Case Report -We reported a rare case of total spina bifida occulta type 1 of dried specimen of a sacrum during routine osteology teaching of undergraduate.

Conclusion-SSBO is a developmental defect and is associated with many other anomalies also. There are many genetic causes which are responsible for SSBO.This is very useful for anesthetists to be aware of this abnormality prior to give epidural anesthesia to avoid dural puncture, neurologist for bladder and bowel disorders and anatomists for correlating different cases.

Post /19/06

STUDY OF DERMATOGLYPHIC PATTERNS IN TYPE 2 DIABETIS MELLITUS POPULATION

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Introduction: Diabetes mellitus is among one of the leading causes of morbidity and mortality. Type II diabetes mellitus is more common and genetically predisposed. Dermatoglyphics patterns are also genetically determined and the idea of using it as a diagnostic aid and supportive evidence in the diagnosis of hereditary disorders becomes now a reality.

Aims And Objectives: The present study intend to evaluate the association between Dermatoglyphic patterns and type II diabetes mellitus.

Material & Method: Finger print patterns of 200 patients diagnosed with type II diabetes mellitus & 200 normal healthy persons as a controls were obtained on white paper by using Kore's duplicating ink from Medicine OPD of Government Medical College, Budaun, UP. Fingertip patterns were studied with the help of magnifying lens. Results were compared in cases & control by Z test. The study parameters were fingertip patterns (Arch, Whorl, Ulnar Loop and Radial Loop).

Result: Whorls were more commonly observed on both the hands of diabetic males as compare to contrpls, which was statistically significant ($p<0.001$). However the ulnar loop frequency was significantly reduced in diabetic males as compared to controls. Similar findings were also seen in diabetic females.

Conclusion: The present study may be useful for screening the population for type II diabetes mellitus to detect the high risk persons.

Post /19/07

BICORNUATE UTERUS A CASE REPORT

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Introduction: Congenital uterine malformations are a heterogenous group of anomalies with a broad spectrum of presentations. Defective development of mullerian duct either during fusion or during septal resorption results in uterine anomalies. The incidence of congenital uterine malformation is estimated to be 3-5 %. Bicornuate uterus is the condition in which the body of the uterus is duplicated and it forms horns or cornua of the uterus.

Case Report: A 26 year old married female with infertility. She underwent hormonal blood tests including FSH, LH, prolactin & progesterone. All the values were within normal limits. But on performing transvaginal sonography we observed bicornuate uterus, in which two horns were clearly visualized. Both right & left ovaries were normal.

Conclusion: Bicornuate uterus results from the abnormal development of mullerian ducts. There is partial failure of fusion of ducts, resulting in uterus divided into two horns. The transvaginal sonography is accurate for the diagnosis of bicornuate uterus.

Post /19/08

HYPOPLASTIC UTERUS A CASE REPORT

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Introduction: Congenital uterine anomalies, which can arise from malformation at any step of the Mullerian developmental process are present in 5.5% of population. The hypoplastic uterus is the condition in which the uterus is congenitally very small in size.

Case Report: A 17 year old girl presented with primary amenorrhoea. The secondary sexual characteristics were well developed. On ultrasonography the hypoplasia of uterus was indicated. The hormonal assay was within normal range.

Conclusion: The early developmental failure of mullerian ducts results in agenesis or hypoplasia of the proximal 2/3rd of vagina, cervix & uterus. The presence of secondary sexual characteristics reflect the normal ovarian function.

Post /19/09

MORPHOMETRIC STUDY OF THE FORAMEN MAGNUM IN NORTH INDIAN POPULATION

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Introduction: The Foramen Magnum is large opening located in the occipital bone of the skull. The morphometric analysis of foramen magnum is clinically and surgically important because vital structures passing through it may suffer compression such as in case of Foramen magnum achondroplasia, Foramen magnum brain herniation and Foramen magnum meningiomas.

Objectives: To study morphometric analysis of foramen magnum in dry human skulls and to measure its antero-posterior diameter, transverse diameter and different shapes of the foramen magnum.

Materials and Methods: 100 dried human skulls of unknown age and sex were obtained from

Department of Anatomy, Rama Medical College & GSVM Medical College, Kanpur [U.P]. Deformed samples were excluded. The different parameter were measured by the help of verniar caliper.

Results: In our study the mean antero-posterior diameter of foramen magnum was 33.79mm.The maximum antero-posterior diameter of foramen magnum was 40mm and minimum antero-posterior diameter was 28.2mm.The mean transverse diameter of foramen magnum was 28.30mm.The maximum transverse diameter of foramen magnum was 36mm and minimum transverse diameter was 21.5mm. The various shapes of foramen magnum observed in present study. The most common shape of foramen magnum was oval shaped in 50%, round shaped in 15%, egg shaped in 12%, tetragonal shaped in 10%, pentagonal shaped in 6%, hexagonal shaped in 4% & irregular shaped in 3% cases.

Conclusion: The morphometric analysis of foramen magnum and its variation is important not only for anatomist but is also important to the anesthetist, neurosurgeons, orthopedicians and radiologists; while planning and performing cranio-vertebral junction procedures.

Post /19/10

ELUCIDATION OF ANTICANCER EFFECTS OF CAROTENOIDS ON OVARIAN CANCER CELL LINES

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Introduction: Since antiquity plants are considered as therapeutic agents in traditional medicine. Evidence suggests that different phytocompounds possess various therapeutic properties, e.g. anti-inflammatory, antitumor, antimutagenic, to a greater or lesser extent. Carotenoids are one such groups of compounds that are part of human diet occurring in naturally occurring products like fruits and vegetables: Carotenoids have gained much attention due to their antioxidant properties and anticancer properties. In the present study, we elucidated the anti-carcinogenic properties of Fucoxanthin and Lutein on Ovarian PA- 1 cell lines at two different time points using in vitro assays and compare the effects of these carotenoids with effects of Tamoxifan (Anti cancer drug) on same cell lines.

Aim of the Study: To screen anti-cancer properties of Fucoxanthin and Lutein on Ovarian PA- 1 cell lines using in-vitro assays.

Objectives of the study

Determination of the effects of graded concentrations of carotenoids on the growth of Ovarian PA- 1 cell line.

Determination of cell viability using MTT assay

Estimation of (IC50) of carotenoids on the growth of Ovarian PA- 1 cell lines

Material and Methods: Cells were grown in DMEM medium (5ml) supplemented with 10% FBS and 1% penicillin streptomyecin. Once cells were 80% confluent they were harvested by trypsinisation and MTT assay was performed to determine cell viability. IC50 of the carotenoids on the growth of Ovarian PA- 1 cell lines was estimated using Graph Pad prism 8.0 software.

Results: Both Tamoxifen and Lutein showed lower percent viabilities at 24hr than 48 hrs incubation, whereas Fucoxanthin showed no such effects.

IC50 All these carotenoids were more potent on PA-1 cells (lower IC50) after 24 hr incubation when compared to their respective 48 hr values. This suggests that lower concentrations of the drugs were able to reduce the viability of PA-1 cells after 24 hr incubation than 48 hrs.

Conclusion: Overall, Lutein at 24 hour was found to be most potent against PA-1 cells in this experiment.

Post /19/11

A STUDY ON THE VARIATION IN THE FORMATION OF THETRUNKS OF BRACHIAL PLEXUS

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Dept. Of Anatomy Government Medical College, Kannauj

Introduction: Brachial plexus is the plexus of the nerves situated partly in the posterior triangle of the neck (Supraclavicular part) and partly in the axilla (infraclavicular part). It is formed by the ventral primary rami of C_5, C_6, C_7, C_8 and T_1 spinal nerves. The cords and the branches are situated in the axilla.

Materials and Methods: The present study has been done in 10 human cadavers in the Department of Anatomy at GMC kannauj, of either sex during dissection by MBBS students. Brachial plexus was dissected on both the sides in supraclavicular as well as infraclavicular regions.Out of 20 brachial plexus dissected on this we observed variations in 8 plexuses. Variations were noted in roots, cards and trunks and branches.

Results: Lateral pectoral nerve arising from middle trunk of brachial plexus instead of lateral cord of brachial plexus. Upper subscapular nerve , nerve to latissimus dorsi and lower subscapular nerves were emerging from posterior division of upper trunk instead of posterior cord of brachial plexus.

Conclusions: The knowledge of variations in the formation of brachial Plexus is very useful for neurosurgeons. It will be of great use in the Surgical treatment of tumors of nerve sheaths such as schwannomas and neurofibromas. The awareness of the variations might also help in treating the non-neural tumors like lipoma. Orthopaedic procedures of the cervical spine also need a through knowledge of the normal and abnormal formation of brachial plexus.

Post /19/12

A ANATOMICAL VARIATION OF THE FLEXOR DIGITORUM BREVIS MUSCLE: A CASE REPORT FROM RAJASTHAN

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Introduction: We observed a variation in right foot of a 60-year-old male cadaver in the flexor digitorum brevis muscle in our routine dissection for MBBS batch 2018-19.

Case Report: In our case, we found that flexor digitorum brevis was giving only three tendons for middle three toes. The tendon of flexor digitorum brevis for the little toe was missing. The absent 4th tendon of the flexor digitorum brevis to little toe in the right foot was replaced by an isolated flexor muscle arising from the medial margin of the tendinous plate of the flexor digitorum brevis. The tendon of isolated flexor muscles inserted in to base of distal phalanx of the little toe.

Conclusion: Variation of the flexor digitorum brevis may be important for plastic surgeons in reconstruction of the heel pad by flexor digitorum brevis musculocutaneous flap transfer.

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