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GCSMC Journal of Medical Sciences

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Caesarean section epidemic: Birthquake on earth!

Haresh Doshi

Historically caesarean section were a sad necessity to save the life of woman or baby and far more dangerous than vaginal birth for both mother and child. With the advances in anaesthetic services, improved surgical techniques, safe blood transfusion and availability of highly effective antibiotics the morbidity and mortality of this procedure have come down considerably. This has, albeit wrongly, emboldened obstetricians to perform more and more Caesarean sections, generating a universal upswing that has hit both developing and developed countries. Currently it is the most common major surgery performed on females worldwide. In recent years the rate has risen to a record level of 46% in China and to levels of 25% and above in many Asian countries, Latin America, and the USA. In 1985, the World Health Organization issued a consensus statement suggesting that there were no additional health benefits associated with Caesarean Section above 10-15%.[1]

India is also not excluded from this trend. At the all-India level, the rate has increased from 2.9 per cent of the childbirth in 1992-93 to 10.2 per cent in 2005-06 (NFHS-3).[2] But there is vast variation across states and rural and urban areas ranging from 5-35 %. Again there is large difference between births in public and private health facilities. A study to examine the escalating rates of Caesarean sections in teaching hospitals in India compared the rates between 1993-94 and 1998-99, with data from 30 medical colleges/teaching hospitals. The overall rate showed an increase from 21.8 per cent in 1993-94 to 25.4 per cent in 1998-99[3] . Similarly two population based cross sectional studies showed, a C-Section rate of 32.6% from Madras city [4] in south India and 34.4% from east Delhi [5] .

This escalating CS rate is a major public health problem because caesarean section increases the health risk for mothers and babies as well as the cost of health care compared with normal deliveries. Caesarean section is associated with maternal postpartum morbidity, reduced fertility, chronic pelvic pain and placental complications (Placenta previa and placenta accreta) in a subsequent pregnancy. Post partum morbidity includes febrile morbidity, sepsis, hemorrhage, wound infection, thromboembolic complications and post operative adhesions. The risk to the woman grow exponentially with each subsequent C-section after the first or second one.[6] The overall relative risk of mortality associated with caesarean section compared with vaginal delivery was 7 decreasing to 5 after the exclusion of women with medical or life threatening antenatal complications like haemorrhage and hypertension [7].

For the child, caesarean section is associated with respiratory distress syndrome, pulmonary hypertension, asthama, less breast- feeding, symptomatic food allergies & obesity.

"Cesarean has been both the blessing and curse of modern medicine".

There are many causes for the rising rates of Caesarean sections. Medical, legal, financial, psychosocial & Institutional factors play a contributing role. Number of elderly gravida, infertility treated cases, obesity & diabetes, all have increased and they lead to increased cesareans which are justified. Cesareans now increasingly done for doctor' or patient's convenience, for astrological reasons and for commercial reasons are wrong and amounts to scientific fraud in clinical practice.

Other reasons for increased caesareans include litigation pressures, increased inductions of labours, repeat cesarean section, cesarean section on demand, fear of painful natural birth and fear of pelvic dysfunction after vaginal delivery. Let me elaborate on each of this. Increased litigations in last couple of decades against doctors have caused them to err on the side of caution by performing cesareans. But it is interesting to note that during the years that defensive obstetrics has grown in numbers there has been no slow down on litigation. Thus performing CS does not make obstetrician immune to litigation. The law cannot dictate obstetric practice. Law is there to control malpractice & negligence. Induction of labour has risen to

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almost 30 % leading to double the incidence of cesarean section for so called failed induction & fetal distress. One must assess the case thoroughly before induction of labour & ensure that it is justified. Repeat cesarean section is now becoming a major indication.[8] Even though vaginal birth after cesarean section (VBAC) is successful in 60-80 % cases with only 1 % chance of uterine rupture, few obstetricians and patients are ready to take the risks of vaginal trial after previous cesarean section. VBAC is potentially underused procedure. The philosophy and practice of VBAC has largely remained with teaching hospitals only. With decreasing incidence of VBAC old adage once a cesarean section always a cesarean is apparently making a comeback. Regarding cesarean section on demand FIGO (Federation International of Gynecologists & Obstetricians) states that performing CS for nonmedical reason is ethically not justified.

"Many celebrity moms all over the world are against caesareans".

Due to their ignorance about childbirth pregnant women have fear of pain in natural birth, have worry that their vagina may be stretched or damaged by a normal delivery or mistakenly believe that cesarean is less risky or at least as safe as vaginal delivery. The women must be counseled that vaginal bypass approach is not as safe as they think. One must understand that pregnancy & delivery are normal physiological states in women and not illness.

Deteriorating skill & inexperience in obstetric manouevers like operative vaginal delivery (forceps, vacuum) and external cephalic version for breech presentation are other causes for increased cesareans. Training of residents in obstetric manouevers is the need of the hour.

"The art of obstetrics is being lost to the knife"

Lastly fetal distress and failure of progress of labour requires mention. Technology boomed in last few decades especially in medical fields and ultrasonography and fetal monitors became obstetricians' favorite necessities. These have lead to overdiagnosis of fetal distress and cesareans without much change in perinatal outcome. Implementation of standard labour management strategies and patience on the part of doctor and patient as well, can reduce primary cesarean section rate without compromising maternal & fetal safety.

The cesarean epidemic is a reason for immediate concern and deserves serious international attention. It is high time to deal with this issue seriously otherwise in near future vaginal delivery will reduce to an alarming low level.

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Fine-needle aspiration cytology (FNAC) of the thyroid: A cytohistologic correlation with critical evaluation of discordant cases

Puja B. Jarwani*, Shantibhai Patel**

Abstract :

Background: Fine needle aspiration cytology (FNAC) is widely considered as the diagnostic technique of choice in the assessment of thyroid lesions. **Aims:** The aim of this study is to determine the utility and diagnostic accuracy of FNAC of thyroid lesions performed at our institution. **Materials and Methods:** A retrospective study of 102 consecutive patients was conducted from January'2011 to October' 2012.Aspiration was taken after detailed clinical history, physical examination and thyroid function test. FNAC results are compared with final histopathological diagnosis. **Results:** The results of FNA cytological diagnosis shows that 9 (8.8%) patients have FNAs which were unsatisfactory/non-diagnostic, 72(70.6%) have non-neoplastic and benign lesions, 14(13.7%) have ACUS/FLUS, 5(4.9%) are reported as suspicious for neoplasm (Follicular/Hurthle cell), 1(1.0%) has lesion that is suspicious for malignancy, and 1(1.0%) has malignant neoplasm. Overall cytohistological concordance is 91.8% and discordance 8.2%.Of the discordant cases false positive rate is 6.25% and false negative rate is 14.29%. In the present study, FNAC has achieved a sensitivity of 85.7%, specificity of 93.8%, diagnostic accuracy of 91.3%, PPV of 85.7% and NPV of 93.8%. **Conclusions:** Strict adherence to adequacy criterion and meticulous examination of all the smears are of paramount importance in reducing discrepant cases.

Key Words: Thyroid gland, Fine needle aspiration cytology, discordance

Introduction :

Palpable thyroid nodules are found in 4-7% of the population, and are more common in women. Although the patient or the clinician may have noticed an apparently solitary nodule, majorities are dominant nodules in nodular goiters and the remaining are follicular adenomas. Thyroid cancer accounts for only 4-10% of palpable nodules, and for about 1.3% of the all malignancies and 0.4% of deaths from cancer in the U.S. An incidence of 0.5-10 cases per 100,000 population has been reported in various geographical regions with 2.3 per 100,000 women and 0.9 per 100,000 men in U.K., where approximately 1000 new cases are recorded each year.

Patients with thyroid nodules should be investigated and treated by a multidisciplinary team that includes a pathologist. The rule of thumb is that FNA should be performed on a solitary or dominant nodule more than 10mm in diameter. The aim is to make the correct diagnosis as soon as possible after presentation, to prevent unnecessary surgery and to guide treatment when malignancy is diagnosed. This has reduced the number of patients requiring surgery, because a clear diagnosis of benign disease indicates that the nodule need not be removed other than for local pressure effects or cosmetic reasons. This has reduced the need for operative surgery for thyroid nodules by 50%.However recent studies from the US and UK suggests that FNA is used as the initial procedure in only 52-84% of patients with thyroid nodules.[1]Practice guidelines set forth by the American Thyroid Association and National Comprehensive Cancer Network ,state that FNA should be used as an initial diagnostic test because of its superior diagnostic reliability and cost-effectiveness, before both thyroid scintigraphy and ultrasonography.[2]

However, there is some gray zone of thyroid cytology where the diagnostic efficacy of FNA declines sharply, [3] rendering it difficult to exactly categorize the nature of the lesion leading to discrepant cases. There is increasing concern that like any other test, FNAC has its limitations. The reported pitfalls are those related to specimen adequacy, sampling techniques, the skill of the aspirator performing the aspirations, the experience of the cytopathologist interpreting the aspirate and overlapping cytological features between benign and malignant follicular neoplasms.[4]Further inadequate, indeterminate FNA, in addition to false positive and false negative diagnosis, are the major limitations of thyroid FNA.

The present study is undertaken to evaluate the accuracy of thyroid FNA and determine the reasons for the cytohistological discrepancies. We critically evaluated all the discordant cases and attempted to ascertain ways of minimizing them in thyroid FNAC.

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Materials and methods :

This is a retrospective study which was conducted at GCS Medical College and Hospital, Ahmedabad, India. The period of study was from January 2011 to October 2012.Study population includes all age groups and both sexes presenting with diffuse or nodular thyroid enlargement and referred to the Pathology Department of our institute. The collected data include age, sex, present, past and personal histories, full clinical examination, laboratory investigations including thyroid profile, ultrasound of the thyroid, FNAC, and histopathological diagnoses where available. The evaluated group consisted of men (5.9%) of the average age of 32 years (8-55 years) and women (94.1%) of the average age of 40.4 years (11-71 years).

Prior to aspiration, careful physical examination was done to note the mobility and nodularity of thyroid gland and presence of any enlarged cervical lymph node. Fine needle aspiration was done by experienced Pathologists under aseptic conditions, using a 22 gauge needle and a 5 ml disposable syringe without the use of a local anesthetic. The aspirate was smeared on microscopic slide, which were fixed with isopropyl alcohol. At least two to three fixed smears were made. Repetition of aspiration was done where the first aspiration was inadequate. No major complications of the technique were noted. These slides were then sent to the histopathology department for cytological examination using H&E stain.

Cytology

Aspirates are divided into six categories:(1) non-diagnostic or unsatisfactory;(2)non-neoplastic and benign; (3) ACUS/FLUS;(4)suspicious for neoplasm-Follicullar/Hurthle;(5) suspicious of malignancy and(5)diagnostic of malignancy. The typing is done according to the Bethedsa system for reporting of thyroid cytopathology. [5]

The first category applies to specimens that are unsatisfactory owing to obscuring blood, overly thick smears, air drying of alcohol-fixed smears, or an inadequate number of follicular cells. For a thyroid FNA specimen to be satisfactory for evaluation (and benign), at least 6 groups of benign follicular cells are required, each group composed of at least 10 cells. The minimum size requirement for the groups allows one to determine (by the evenness of the nuclear spacing) whether they represent fragments of macrofollicles. Also the balance between cellularity and colloid is more important. Cysts containing colloid or histiocytes only, in absence of epithelial cells, should be classified in this group but should be clearly described as cysts.

Non-neoplastic and benign are cases with features consistent with a colloid nodule or thyroiditis. The aspirate from nodular goiter shows abundant thin colloid, sometimes with a cracking artifact. The follicular cells lie in sheets, follicles or singly. Foamy and haemosiderin laden macrophages are usually present though their numbers will vary with the extent of degeneration. Cysts may be classified in this if benign epithelial cells are present. In some cases of hyperplastic nodules the appearances will fall within the spectrum more usually associated with follicular neoplasms. The third category comprises mainly of atypical cells of undetermined significance/ Follicular lesions of undetermined significance. This consists of a set of lesions with architectural/cytological atypia but inadequate for the diagnosis of follicular neoplasm. The fourth category comprises mainly smears suspicious for follicular neoplasm/Follicular neoplasm. Follicular Hurthle cell tumors are included in this group. These are cellular aspirates, comprising follicular or Hurthle cells arranged in microfollicles or three-dimensional groups, with little colloid. The fifth category comprises results which are suspicious of malignancy (papillary, medullary or anaplastic carcinoma, or lymphoma). The sixth category comprises results which are diagnostic of malignancy (unequivocal features of papillary, medullary or anaplastic carcinoma, or lymphoma). [1,5]

HISTOLOGY

Histology included biopsy specimens and surgical excisions. These are classified as: benign (intervention not needed)-colloid nodular goitre, follicular adenoma, Hashimoto's thyroiditis; or malignant-follicular carcinoma, papillary carcinoma, anaplastic carcinoma, lymphoma or metastatic carcinoma. The discordance between cytological and histological diagnosis are selected and cytological smears of these cases are reevaluated for the detection of possible causes of failure.

STATISTICAL ANALYSIS

The results are analysed on an intention to treat principle. It is impossible to distinguish between follicular adenomas and follicular carcinomas on FNA cytology, therefore, classifying a follicular adenoma as suspicious was not regarded as a false positive. Sensitivity, specificity, diagnostic accuracy, positive predictive value, negative predictive value, false negative rate and false positive rate were calculated.

a) True positive (TP): positive result in the FNA for malignancy and confirmed in the histological study.

b) False positive (FP): positive result in the FNA for malignancy but not confirmed in the histological study.

c) True negative (TN): negative result in the FNA for malignancy and no carcinoma in the histological study.

d) False negative (FN): negative result in the FNA for malignancy but with a carcinoma in the histological study.

e) Sensitivity (S): proportion of patients with associated carcinoma and a positive result in the FNA for malignancy, S = TP/ (TP+FN)

f) Specificity (Sp): proportion of patients without associated carcinoma and with a negative results in the FNA for malignancy SP = TN (TN+FP).

g) Positive predictive value (PPV): proportion of patients with a positive results and histological confirmation PPV = TP(TP + FP)

h) Negative Predictive value (NPV): proportion of patients with negative results and without a carcinoma in the histological study. NPV = TN (TN+FN)

i) Diagnostic accuracy (DA) proportion of patients diagnosed correctly by the diagnostic test, DA = (TP + TN) / (FP + FN + TP + TN)

j) False positive rate (FPR) =FP / (FP + TN) *100

k) False negative rate (FNR) =FN / (TP + FN) *100.

Inadequate smears are not included in calculation of the above figures.

Results :

A total of 102 patients underwent FNAC of thyroid swellings in the cytopathology section of Pathololgy Department of our institute within the study period. Out of these, 96 are female patients, while 6 are males as shown in Figure 1. The male to female ratio is 1:16. Age of the patients ranges from 8-71 years. 9.8% are in the age group of 0-20 years, 36.27% are in the age group of 21-40 years, 28.43% are in the age group 41-60 years and only 0.98% are in the age group of 61-80 years. The age distribution of thyroid swellings is as shown in Figure 2.

The results of FNA cytological diagnosis shows that 9 (8.8%) of the patients have FNAs which were Unsatisfactory /non-diagnostic, 72(70.6%) patients have non-neoplastic and benign lesions, 14(13.7%) patients have ACUS/FLUS, 5(4.9%) patients are reported as suspicious for neoplasm (Follicular/Hurthle cell), 1(1.0%) patient has lesion that is suspicious for malignancy, and 1(1.0%) has malignant neoplasm [Table 1 and Fig 3]

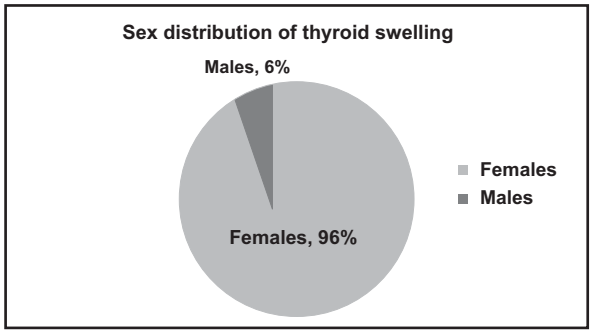

Figure 1 : Sex distribution of thyroid swellings

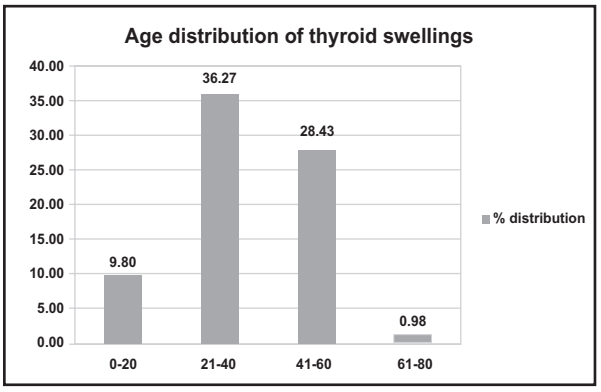

Figure 2 : Age distribution of thyroid swellings

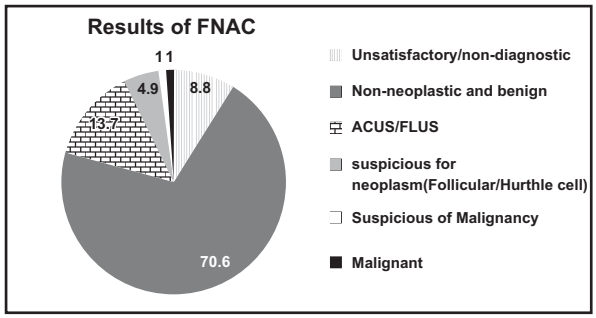

Figure 3- Pie Chart Showing Results of FNAC

Table 1: Diagnoses in 102 thyroid swellings on FNAC

Lesions(N=102)	Frequency	Percentage
Unsatisfactory/non-diagnostic	09	8.8
Non-neoplastic and benign	72	70.6
ACUS/FLUS	14	13.7
suspicious for neoplasm(Follicular/Hurthle cell)	05	4.9
Suspicious of Malignancy	01	1.0
Malignant	01	1.0

The distribution of unsatisfactory/non-diagnostic, non-neoplastic and benign lesions, ACUS/FLUS, suspicious for neoplasms-follicular/ hurthle cell lesions, suspicious for malignancy, and malignant cases on cytology is as shown in Table 2.

Table 2: Distribution of Unsatisfactory /non-diagnostic, non-neoplastic and benign lesions, ACUS/FLUS, suspicious for neoplasm-follicular/Hurthle cell lesions, suspicious for malignancy, and malignant cases on cytology

Cytology	Frequency	Percentage
A) Unsatisfactory /non-diagnostic lesions (N=9)		
Inconclusive	04	44.0
Cystic lesions	05	55.6
B) Non-neoplastic and benign lesions (N=72)		
Cystic lesions	01	1.4
Colloid goiter	56	77.8
Grave s Disease	01	1.4
Hyperplastic/Toxic goitre	02	2.8
Lymphocytic thyroiditis	10	13.9
Chronic granulomatous thyroiditis	02	2.8
C) ACUS/FLUS (N=14)	14	100
D) Suspicious for neoplasm (N=05)		
Follicular neoplasm	05	100
E) Suspicious for malignancy (N=01)		
Anaplastic/poorly differentiated papillary Carcinoma	01	100
F) Malignant cases (N=01)		
Anaplastic/poorly differentiated papillary Carcinoma	01	100

The cytological diagnoses are then compared with 49 available histopathological diagnoses. Cytohistoconcordance is obtained in 45 cases, whereas remaining 4 show discordant results as shown in Table 3.Of the 4 discordant cases 1 colloid goiter is reported as follicular adenoma and 1 is reported as follicular carcinoma on histopathology.2 lesions suspicious for follicular neoplasm are reported as adenomatous goiter in histopathological examination. These are false negative and false positive cases, misdiagnosed on cytological examination as shown in Table 4.

Table 3: Correlation of cytological and histopathological diagnoses(n=49)

Cytological diagnoses	Histopathological diagnoses							
	IA	CG	AG	Thy Cyst	FA	FC	AC/PC	Total
Cystic lesions(N=2)	-	-	-	2	-	-	-	2
Non-neoplastic and benign lesions(N=30)								
Colloid goiter	1	25	2	-	1	1	-	30
ACUS/FLUS(N=10)	-	5	-	-	4	1	-	10
Suspicious for follicular neoplasm(N=5)	-	-	2	-	2	1	-	5
Suspicious for malignancy(N=01)	-	-	-	-	-	-	1	1
Malignant cases(N=01)	-	-	-	-	-	-	1	1

CG:Colloid Goitre, AG:Adenomatous Goitre,Thy cyst:Thyroglossal cyst, FA:Follicular adenoma, FC:Follicular Carcinoma,AC:Analplastic Carcinoma,PC:poorly differentiated papillary carcinoma.

Table 4: Cytohistologic discordance of thyroid lesions(N=4)

False negative(N=2)		
Cytological diagnoses	**No. of cases**	**Final histopathology diagnoses**
Colloid goiter	2	Follicular adenoma(N=1)
		Follicular Carcinoma(N=1)
False positive(N=2)		
Suspicious for Follicular neoplasm	2	Adenomatous goitre(N=2)

In the present study, FNAC has achieved a sensitivity of 85.7%, specificity of 93.8%, diagnostic accuracy of 91.3%, positive predictive value of 85.7% and negative predictive value of 93.8%. Overall cytohistological concordance in all categories is 91.8% and discordance 8.2%.Of the discordant cases false positive rate is 6.25% and false negative rate is 14.29%.

Discussion :

Thyroid nodules are very common occurring in 4% of the population aged between 30 and 60. [6] Most are benign and only between 10% and 20% are malignant. [8] Therefore, surgery as the initial intervention or investigation will have a very low yield. Very few diagnostic tests help differentiate between benign and malignant nodules. Thyroid ultrasound can distinguish solid from cystic lesions but not all cystic lesions are benign. Thyroid isotope scans using technetium-99 classify nodules as hot or cold. Hot nodules are functioning and should be benign whereas cold nodules are nonfunctioning and might be malignant. However, fewer than 20% of cold nodules are malignant leading to a high false positive rate. The addition of thallium scans is a newer development but again has high false positive rates. The poor accuracy and high cost of nuclear imaging plus the significant radiation burden it places on patients has led some to suggest that its routine

Table 5: Comparision of the results of the present study with other previous studies

Reference	No. of cases	No. of histology	SN %	SP %	PPV %	NPV %	FN (n)	FP (n)	Unsatisfa-ctory %	Accuracy %
Malar et al [2]	125	125	98	70	91	93				91
Hall et al[6]	795	72	-	-	-	-	5	7	6-32	89
Kendall[7]	113	34	-	-	-	-	2	7	11	-
Pandey et al[8]	447	112	57.14	90	70.58	83.33	11	13	4.47	80.28
Bagga et al[9]	252	32	66	100	100	96	1	0	1.6	96.2
Ergete et al[10]	344	344	67	84.7	-	-	15	45	0.87	82
Leonard et al[11]	335	184+49 Follow up	88	78	46	97	4	36	18	80
Godinho-Matos et al[12]	144	28	73	100	100	69	4	4	13	83
Rosen et al[13]	59	41	-	-	100	80	2	0	-	-
Mandreker et al[14]	1992	238	-	-	-	-	9	1	12	-
Holleman et al[15]	112	53	84	52	53	83	2	1	11	65
Present study	102	49	85.7	93.8	85.7	93.8	2	2	8.8	91.3

SN-Sensitivity, SP-Specificity, PPV-Positive predicitive value, NPV-Negative predictive value, FN-False negative, FP-False positive.

use in investigating the solitary thyroid nodule should be abandoned, while recognizing its value in follow up after a thyroid malignancy.[16]

Over the past two decades, FNA has become a primary diagnostic tool for evaluating thyroid nodules and a correct cytologic diagnosis obviates unnecessary thyroid surgeries. The important steps in FNA thyroid are careful sample procurement, appropriate sample preparation and accurate interpretation by cytopathologists. An appropriate diagnosis can only be offered when all these steps are taken into consideration. Improper sampling and overinterpretation can lead to meticulously and carefully scrutinize for various cytologic features so as to reduce the number of discrepant cases .In the present study , we made an effort to ascertain the possible reasons for discrepancies and ways to minimize them. The value of any diagnostic test lies in its ability to detect the presence of disease when it is present (sensitivity) and reliably verify the absence of disease when it is not present (specificity).As reported earlier, the sensitivity and specificity of the thyroid FNAC ranges 43 to 99% and 47 to 100% respectively. Factors contributing to this broad range of sensitivity and specificity are the handling of suspicious cases, the length of follow up, and the inclusion of occult papillary carcinoma in the category of false negative diagnosis. Our findings are in line with those reported in other series. [4-8, 12-15, 18]

In the present study, indeterminate category consisting of ASCUS/FLUS, Suspicious for neoplasm and suspicious for Malignancy, accounts for 19.61% of the cytology cases. Histopathological samples are available in 16 out of 20 cases. Of the 10 cases reported as ACUS/FLUS 5 are reported as colloid goiter, 4 as follicular adenoma and 1 as follicular carcinoma. Out of 5 cases reported as suspicious for follicular neoplasm on cytology, 2 are reported as colloid goiter, 2 as follicular adenoma and 1 as follicular carcinoma in histopathology. The 1 lesion which is reported as suspicious of malignancy proved to be anaplastic carcinoma/poorly differentiated papillary carcinoma on histopathology.

It is difficult to differentiate follicular/hurthle cell adenoma from carcinoma on cytological assessment because cytology cannot evaluate the criteria of vascular or capsular invasion or of intrathyroid spread. Greaves et al [17] found

that in 63 out of 92 cases of follicular lesions, there was no distinguishing cytologic features predictive of the histologic outcome. They concluded that this is a gray area in cytologic diagnosis due to the presence of various overlapping cytologic features at the light microscopic level. There is a high possibility of suspicious or indeterminate cases to be neoplastic and a good chance to be malignant. In our study, 3 out of 16 cases are confirmed as carcinoma on subsequent histology. In an another study, it was reported for 57-70% of thyroid aspirates [10]. So, based on this fact, it is reasonable to consider patients with indeterminate or suspicious FNA results for either repeat aspiration or surgical intervention.

False positive rate is 6.25% in our study, which was consistent with other reports that cite false positive rate results from 0-9%. [19, 20] Papillary hyperplasia in adenomatous goiter can reveal excess of cellularity with plenty of sheets of benign follicular cells. Pappillary hyperplasia and hyperplastic nodules are well known to occur in adenomatous goiters and could have been responsible for an incorrect diagnosis of follicular neoplasm in three of the cases among Follicular patterned smears. Aspiration was probably done from the hypercellular are of adenomatous goiter which led to over diagnosis in these cases. Cytological distinction between these two conditions is often difficult due to the presence of various overlapping cytologic features. Both showed increased cellularity and scant or absent colloid. Architectural pattern of regular follicles and honeycomb sheets of adenomatous goiter versus syncytial-type fragments with crowding and overlapping of nuclei and irregular follicles of follicular neoplasms is an important criterion that distinguishes the two entities. [21]

The false negative FNAC results may occur because of sampling error or misinterpretation of cytology, and are of great concern because they indicate the potential to miss malignant lesion.[6] False negative rates in our series accords with the reports that suggest a range in literature from 6.6 to 25.5%. [22, 23] This high rate of failure to diagnose cancer could be attributed to the failure of aspiration from precise locations.

In the present study we have achieved diagnostic accuracy of 91.3%,positive predictive value of 85.7% and negative predictive value of 93.8% which is similar to the experience of the others. [8-12]. Unsatisfactory samples may be because of sclerotic or calcified lesions and more commonly when there are large areas of cystic degeneration or necrosis.FNA of 9 patients (8.8%) yielded inadequate samples, which again correspond to studies in which inadequate sampling has been reported from 6-32% [6].The advent of ultrasound (USG) guided FNA has improved sample acquisition which are difficult or impossible to detect on physical examination. Borget et al did an assessment of the cost of FNAC as a diagnostic tool in patients with thyroid nodules and concluded that in future, routine ultrasound guidance and on-site assessment of cytopathological adequacy would reduce costs. [24]A repeat FNA should be performed by experienced operator, and pathologists should be aware of changes occurring in thyroid following FNA procedure which are labeled as WHAFF(worrisome histologic alterations following fine-needle aspiration).It has a high negative value, which is useful to reassure the majority of patients presenting with thyroid enlargement. However, a negative FNA should never exclude malignancy if there is a strong clinical suspicion.

Pitalls in FNAC of the thyroid as mentioned by Shaha[25] are:

Adequacy of specimens(quantitative and qualitative), accuracy of specimens(no homogeneity of needle placement),accuracy of cytopathological interpretation, cysts(difficulties with degenerative nodules),follicular lesions(benign vs.malignant),Hurthle cell lesions(benign vs.malignant),and Lymphocytic lesions(Lymphocytic thyroiditis vs.Lymphoma).

The cytopathologists should be aware of the potential diagnostic pitfalls and the interpretational errors that can be reduced further, if the aspirates are obtained from different portions of the nodule, with the use of the ultrasound-guided FNA procedure, with expert cytopathologists to perform and interpret the aspirates, and with the use of immunohistochemical and molecular markers. Our surgeons find that the cytopathologic information is very useful for scheduling patient's visits and making their surgical plans.

Conclusion :

FNAC as such is an expedient, effective and safe diagnostic method for defining thyroid disorders, but inadequate, indeterminate FNA in addition to false positive and negative diagnosis are the major limitations of thyroid FNA. Also follicular patterned lesions and Hurthle cell rich smear offer diagnostic challenge perpetually. An attempt is made by us to find the level of cytohistologic concordance, critically evaluate the discrepant cases and possible methods in which it could be minimized. Thus, strict adherence to adequacy criterion and meticulous examination of all the smears are of paramount importance in reducing the discrepant cases.

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Burden of Anemia among different age groups in Ahmedabad city of Gujarat, India

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Abstract :

Background: Anemia is the most common hematological disorder highly prevalent in all developing countries. **Objective:** This study was carried out to estimate the prevalence of anemia according to severity, in patients attending outpatient department of one of the tertiary care hospital in the Ahmedabad city of Gujarat, India during the period from March 2011 to March 2012. **Material & Methods:** A total of 16105 patients (>5yrs) who had their hemogram done during the period from March 2011 to March 2012 were analyzed. Anemia was defined as a hemoglobin level less than 13 gm/dl in males and less than 12 gm/dl in females and further graded into mild, moderate and severe. Hematological parameters were measured on hematology analyzer (Sysmex KX-21). **Results:** Overall prevalence of anemia was 65.1% in females and 32.5% in males. Maximum prevalence (94.5%) in females was in the adolescent age group (11-20 yrs) and in males the maximum prevalence (56.2%) was in the younger age group (0-10 yrs). **Conclusion:** Anemia is widely prevalent in all age groups irrespective of gender. Hence detailed studies are needed to assess the overall burden of anemia and its causes in the general population in India.

Key Words: Anemia, Hemoglobin, Prevalence.

Introduction:

Anemia is the most common hematological disorder and hence of significant public health importance in developing countries like India. It is functionally defined as (decreased oxygen carrying capacity of blood) an insufficient erythrocyte mass to adequately deliver oxygen to peripheral tissues. For practical purposes haemoglobin is the parameter most commonly used to establish the presence of anemia.[1]

The economic and social consequences of anemia, as yet unquantified, are an enormous burden on health care, educational resources, labour productivity and physical and mental capacity of large segments of the population.[2]

In India, anemia is widely prevalent and affects both genders and all age groups.[3] Most of the studies to date have focused on the prevalence of anemia in the most vulnerable two sections of society - adolescent girls & females in reproductive age group. Very few studies have been done to estimate the overall prevalence of anemia according to age & gender in the general population. As anemia in any age group irrespective of gender has wide consequences affecting the overall development of individuals, this study was carried out to estimate its prevalence in the general population according to age and gender.

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Material and Methods:

This analytic study was carried out at one of the tertiary care hospitals in the Ahmedabad city of Gujarat, India. Data of 16105 patients (>5 yrs) attending O.P.D, whose hemogram was done during the period from March 2011 to March 2012 was analyzed. Hemoglobin, Erythrocyte Count, Total Leukocyte Count, Thrombocyte Count, & indices were measured by automated three part differential Hematology Analyzer (Sysmex KX-21). Peripheral smears were prepared, stained with Romanowsky stain and examined by light microscopy. The automation findings were confirmed, malarial parasite infection ruled out and anemia if present morphologically typed.

Anemia was categorized as mild (hemoglobin 10-13 gm/dl in males and 10 -12 gm/dl in females), moderate (hemoglobin 7-10 gm/dl in both genders) and severe (hemoglobin less than 7 gm/dl in both genders). Prevalence of anemia was then calculated according to age and gender & graded as mild, moderate or severe. Moderate & severe cases were further studied for the morphological type.

Results :

Out of total 16105 patients analyzed 8983 were females and 7122 were males. Further data was segregated according to age group and haemoglobin level.

Table 1: Prevalence of anemia in females according to age group and severity

Age-group (in years)	Total (n)	Hb >12gm%	Hb <12gm%			
			10-12gm%	7-10gm%	<7 gm%	Total
5-10	641	45.5% (292)	38.5% (247)	14.4% (92)	1.6% (10)	54.5% (349)
11-20	1000	5.5% (55)	59.6% (596)	27.2% (272)	7.7% (77)	94.5% (945)
21-40	3504	25.8% (905)	45.8% (1604)	23.7% (830)	4.7% (165)	74.2% (2599)
41-60	2638	47.5% (1252)	36.3% (957)	13.3% (350)	2.9% (79)	52.5% (1386)
>60	1200	52.3% (628)	35.4% (425)	10.6% (127)	1.7% (20)	47.7% (572)
Total	8983	34.9% (3132)	42.6% (3829)	18.6% (1671)	3.9% (351)	65.1% (5851)

Table1 shows the prevalence of anemia for females according to age and severity. Prevalence of anemia in females was 65.1%, which included 42.6% mild, 18.6% moderate and 3.9% severe cases. Maximum prevalence (94.5%) was seen in 11-20 yrs age group i.e., adolescent period, followed by 74.2% in 21-40 yrs age group i.e. reproductive age. Moderate & severe cases ranged from 28.4 % to 34.9 % in both age groups.

Table 2: Prevalence of anemia in males according to age group and severity

Age-group (in years)	Total (n)	Hb>13 gm%	Hb < 13 gm%			
			10-12gm%	7-10gm%	<7gm%	Total
5-10	797	43.8% (349)	39.6% (316)	13.6% (108)	3.0% (24)	56.2% (448)
11-20	903	62.5% (564)	31.1% (281)	4.9% (44)	1.5% (14)	37.5% (339)
21-40	2138	73.2% (1565)	18.8% (403)	5.9% (126)	2.1% (44)	26.8% (573)
41-60	2039	71.2% (1451)	20.4% (416)	6.8% (138)	1.6% (34)	28.8% (588)
>60	1245	70.8% (881)	22% (274)	6.4% (80)	0.8% (10)	29.2% (364)
Total	7122	67.5% (4810)	23.7% (1690)	6.9% (496)	1.8% (126)	32.5% (2312)

In males prevalence was found to be 32.5% with 6.9% suffering from moderate anemia and 1.8% were severely anemic. Anemia was most prevalent (56.2%) in the younger age group (5-10 yrs) in males of which 16.6% suffered from moderate to severe anemia (Table 2).

Table 3: Haematological Parameters in cases of moderate to severe anemia in both genders (n=2692)

Hematological Parameter	Males (n=622)	Females (n=2070)
MCV	74.96 + 31.9	71.58 + 24
PCV	27.9 + 4.1	27.8 + 4.7
MCH	23.43 + 12.3	21.89 + 8.3
MCHC	30.1 + 6.64	30.07 + 3.03
RBC Count	4.0 + 0.8	3.97 + 1.12

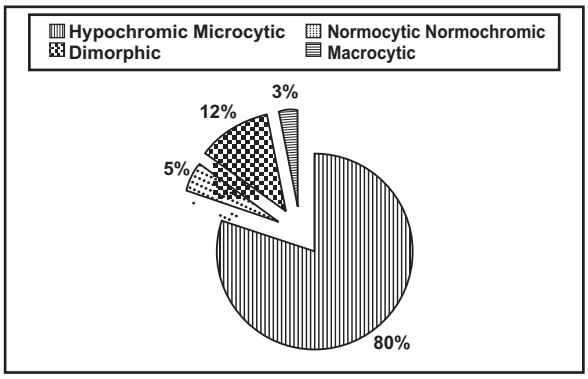

Figure 1: Morphological Distribution of Moderate to Severe Anemia among Female Patients

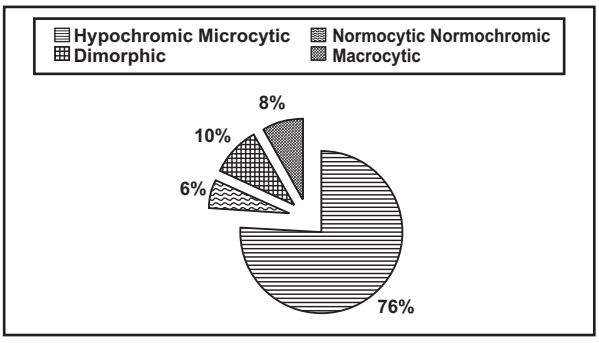

Figure 2: Morphological Distribution of Moderate to Severe Anemia among Male Patients

Table 3 depicts the hematological parameters and Fig 1 & 2 show the morphological type of anemia on P/S examination in patients with moderate & severe anemia. Out of the males & females with hemoglobin <10 gm/dl (n=2692), 75.6% & 79.9% had hypochromic microcytic, 10% & 11.9% had dimorphic, 6.4% & 5% had normochromic normocytic and 7.9% & 3.2% had macrocytic morphology, respectively. No significant difference was found in the hematological parameters between males and females.

Discussion :

India is among the countries in the world with a high prevalence of anemia. In India, the prevalence of anemia is high because of : Low dietary intake of iron (<20mg/day) and folic acid (<70 mg/day), poor bio-availability of iron (3-4% only) in phytate fibre-rich Indian diet, and chronic blood loss due to infestations like malaria and hookworm [4][5] .

According to the WHO classification of "anemia as a problem of public health significance", prevalence of anemia of >40% was considered to be a severe, between 20% - 40 % to be a moderate, & between 5% - 20% to be a mild public health problem[6]. In the present study the prevalence in females is >40% and thus of a severe magnitude while the prevalence in males is a moderate public health problem. Global prevalence of anemia in developed & developing countries and India[7] states the prevalence to be in 50% in women and 35% in men in the urban Indian population. The present study shows a similar result for men but a higher prevalence was found in females.

Toteja et al[8] in a study on adolescent girls from 16 districts of India found 90% prevalence with 7.1% having severe anemia. Similar high prevalence (96.5%) in adolescence was also reported by Bulliyy et al[9]. Adolescence is the formative period of life when many physical, psychological and behavioral changes take place[10]. A high prevalence of anemia in this group is of serious concern as these are the future mothers. NFHS-3 (2005-2006)[11] shows the prevalence of anemia in ever married women(15-49 yrs) to be 56.2% and in pregnant women to be 57.9%, while WHO global database[6] states it to be 52% and 49.7% respectively. In the present study, 74.2 % females in the reproductive age group were anemic. The high prevalence of anemia among women in India is a serious health hazard for them, for their families and for the economic development and productivity of the country[12].

There is paucity of data on the overall prevalence of anemia in males. According to NFHS-3 the prevalence among men (15-49 yrs) was 24%, & in an another study by Malhotra P et al[13] the prevalence in males (16-70 yrs) was 44.3%, while in the present study the prevalence was 32.5%. The present study also shows a higher prevalence of anemia in males in the younger age group (<20 yrs) as iron needs are highest in males during peak pubertal development because of a greater increase in blood volume, muscle mass and myoglobin[14]. In a study by Jain T et al[14] prevalence of anemia in adolescent boys was 42.2% with 23% having moderate to severe anemia. Table 4

shows the state wise prevalence of anemia among men (15-49 yrs)[11].

Table 4: Prevalence of anemia among men (15-49 yrs),by state,2005-2006[11]

States	Total (%) (Hb < 13 gm/dl)
Punjab	13.6
Maharashtra	16.8
Gujarat	22.2
Himachal Pradesh	18.9
Haryana	19.2
West Bengal	32.3
Rajasthan	23.6
Jharkhand	36.5
India	24.2
Present study	32.5

Morphologically the most common type of anemia in both males and females with hemoglobin < 10 gm/dl was hypochromic microcytic, suggestive of iron deficiency. Macrocytic anemia was reported slightly more in males but more detailed studies are needed to find out the exact etiology. Overall the higher prevalence of anemia seen in thus study may be because this was done in a tertiary care set up where usually the subjects are patients suffering from various infections, but the fact cannot be ignored that this gives an indication of the high prevalence of anemia in the draining area of this hospital.

Conclusion and Recommendation

Though strikingly high prevalence is seen in females of all age groups, the prevalence in males also falls in the category of moderate public health problem. The prevalence of moderate & severe anemia increases in the younger age group in males (5-10 yrs) to match that of females (16.6%). Adolescence is the most vulnerable group both in males and females because of the rapid growth and increased nutritional requirement in this period. Severe anemia is less prevalent in males ranging from 1.5 to 3% but is more in females reaching up to 7.7%.

Despite reports of several major surveys (NNMB, NFHS, DLHS) showing a high prevalence of anemia and institution of various national programmes (NAPP, NACP, Tenth Five Year Plan) there has not been any substantial decline in the incidence or adverse consequences of anemia.

Not only formulation but effective execution and continuous monitoring is required for the public health control of nutritional anemia. A combination of different approaches aimed at elimination of the causes, supplementation of micronutrients and increase in the awareness of the general population with repeated field trials may help to overcome this challenge.

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Relation of BMI & hypertension in natives of Gujarat

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Abstract :

Introduction: A relation is said to exist between hypertension and Body Mass Index. However very few studies have been carried out to establish association, if any, between body mass index and hypertension in different Asian population. **Objective:** We compared the association of hypertension with BMI in adults from urban population of Gujarat, India and decided BMI cutoffs to predict hypertension in this population. **Material and method:** A study involved 2000 adults from both genders of the different age groups of 20-70 years from the urban population of Gujarat. Blood pressure and indices for BMI were measured and determined an optimal BMI cutoff. **Results:** The prevalence of hypertension in men from Gujarat Urban population was 48.51% and in women was 39.39%.The overall analyses suggested optimal BMI average of 25.6 from adults of Gujarat urban population. The average was found high and it was 0.43 units higher in women/men than in men/women and the average was also found high in the older/younger (20-40 y) than in the younger/older (41 70 y) participants. **Conclusions:** It has been observed that there is an ethnic difference in the association between BMI and hypertension and in optimal BMI cut off for the population of urban Gujarat.

Key Words: Blood pressure, BMI, Ethnicity, Hypertension, Obesity

Introduction :

Body mass index i.e. has positive association with hypertension an so with morbidity and mortality from hypertension, cardiovascular disease, type II diabetes mellitus, and other chronic diseases. [1] BMI has become a standard tool for the measurement of obesity and overweight. BMI is measured as per formula i.e. BMI (kg/m^2) = weight/ $height^2$. Since the early 1990s, the World Health Organization (WHO) has recommended using cut points of 25 and 30 kg/m^2, respectively for overweight and obesity.[2] Obesity is the state of excessive weight which is the result of accumulated fat in the body beyond the desirable level in relation to other physical factors like age, sex etc and 20% more weight than the standard weight is considered as obesity. The issue of overweight and obesity has become a serious public health concern throughout the world during the last few decades. The prevalence of overweight and obesity is increasing, and obesity is estimated to be a major leading cause of mortality and morbidity, causing an estimated 2.6 million deaths worldwide and 2.3% of the global burden of disease.[3]

BMI is strongly associated with hypertension. Overweight is the one of the major predisposing factors for hypertension. A person with BMI above 25 is considered at risk. However these recommendation are required revision as several recent studies has shown that BMI cut off values are expected to vary in different ethnicity and in subgroups of the same ethnicity. Ethnic difference may be due to difference in total fat, abdominal fat with the same BMI. It is observed that Asian population is more vulnerable to hypertension in comparison to other population because of high amount of fat, particularly central adiposity. For Asian population an adult with BMI more than 23 is considered to be at the moderate to high risk of cardiovascular diseases.[4] Amongst Asians there are many subgroups in relation to difference at the level of body composition, genetic structure, diet, social status, financial status etc.[5]

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Methodology :

A cross sectional study was carried out with total number of 2000 individuals [adult men and women] after screening and obtaining written informed consent (The objective and method of the study was explained to each).

Inclusion Criteria : Male & Female from Ahmadabad city of Gujarat Domicile.

Subject selected were residing in the city since their birth.

Age of the person was varying from 20 to 70 years.

Exclusion Criteria : Pregnant and lactating women, Age < 20 years & > 70 years.

Subject taking any type of anti hypertensive medication.

Investigation was started with the filling up of a form about brief bio-data. The subject height and weight were recorded by using standard protocol of Weiner and Laurie. The subject height was recorded to nearest of 0.1 cm by using anthropometric tool and weight was recorded with correction of 100 gm by using portable digital scale. Weight was deducted by 500 mg for light weight clothing. BMI of the subjects was calculated as weight in kilograms divided by square of the height in meters. BMI more than 25 and 30 was taken for overweight and obesity respectively. Subject was asked to sit comfortably on the chair with support to his/her arm. Blood pressure was recorded by standard mercury sphygmomanometer after applying standard pressure cuff to upper arm. By standard auscultatory technique both systolic and diastolic pressure are measured with stethoscope over brachial artery taking care that Hg column fell at the rate of 2mm of Hg/second. Pressure was recorded twice at the interval of five minutes and average was taken in to consideration. If difference was found of more than 5 mm of Hg in two readings, an average was taken into consideration after taking an additional reading.

Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure in its seventh report has recommended that normal BP is defined if blood pressure is less than 120/80 mmHg, pre-hypertension is defined as 120 139/80 89?mmHg, stage I hypertension as 140 159/90 99 mmHg, and stage II hypertension if blood pressure is equal to and above 160/100 mmHg.[6] If systolic blood pressure is 140 mm Hg or higher and diastolic blood pressure is lower than 90 mmHg it is known as Isolated systolic HTN. If systolic blood pressure is lower than 140 mm Hg and diastolic blood pressure is 90 mm Hg or higher it is known as isolated diastolic HTN. Systolic blood pressure of 140 mm Hg or higher and a diastolic blood pressure of 90 mm Hg or higher is systodiastolic HTN.[7, 8]. Persons on antihypertensive drugs at the time of study were not included in as a result of differing effects of such drugs on systolic versus diastolic blood pressure. The age grouping was made according to criteria adopted by Brown et al.[9] Age was classified in three groups. [Group I 20-39yrs, II 40-59 yrs, III 60 yrs and above]

Statistical Analysis :-

Values are expressed as means ± SD. Microsoft® Office Excel® 2007 (© 2006 Microsoft Corporation, USA) and SPSS Statistics 17.0 (IBM® SPSS® system, IBM Corp. New York) were used for data analysis. The significance of differences between variables and hypertension were analyzed by Chi square test. The probability level for significance was set at $P < 0.05$.

Results :

The cross sectional study in 2000 subjects for evaluation of relationship between hypertension and various physiological parameters were analyzed results as below.

Table 1: Correlation between Gender and Hypertension.

Gender	Hypertension		Total
	No	Yes	
Male	519	491	1010
Female	601	389	990
Total	1120	880	2000

$x^2 = 17.252 \quad p < 0.0001$

From above statistics it is observed that total women examined were 990 while men examined were 1010 in number. Out of total 990 women, 389 were hypertensive. Out of total 1010 men, 491 were hypertensive. Chi square test result was $p < 0.0001$, which suggested differences between genders were highly significant.

Table 2: Correlation between Hypertension and Age group.

Age in yrs	Hypertension		Total
	No	Yes	
20-39	435	155	590
40-59	470	420	890
60 or above	215	305	520
Total	1120	880	2000

$x^2 = 124.257 \quad p < 0.0001$

In the age group I [20-39yrs] 73.73 % had normal blood pressure, and 26.27 % were hypertensive. In the age group II [40-59yrs] 52.81 % had normal blood pressure, and 47.19% were hypertensive. In the age group I [60 yrs and above] 41.35 % had normal blood pressure, and 58.65 % were hypertensive. P value < 0.0001 suggested highly significant correlation between this parameters.

Table 3: Correlation between BMI and Hypertension.

BMI	Hypertension		Total
	No	Yes	
Normal	760	405	1165
Overweight	85	160	245
Obese	275	315	590
Total	1120	880	2000

$x^2 = 106.582 \quad p < 0.0001$

The mean BMI was 25.6 and 28.8 for hypertensive men and women respectively for the urban population of Gujarat. P value < 0.0001 was highly significant. It is also observed that with normal BMI 65.23 % had normal blood pressure and 34.76 % were hypertensive suggesting a strong association of hypertension with BMI.

Discussion & Conclusion:

Lower BMI (<22-24) cutoff in Chinese (23-24), Vietnamis (21-22.5) & Indonesian (20.5-21) population was found by Nguyen T Tuan but it varied between population groups [10]. As per study carried out by A. Colin Bell it was found that although ethnic differences exist in the association between BMI & HT. In lower BMI stronger association was found between BMI & hypertension in Chinese & not in Filipino compared with non-Hispanic whites [11]. In our study males & females with higher BMI were associated with hypertension. As per study carried out by Tuan et al there is ethnic differences in association between BMI & Hypertension and BMI cutoff for overweight is < 25 in East & Southeast Asian populations [12]. In our study we have hypertensive males & females in higher BMI group. In males the prevalence of hypertension in general is high in all age groups however there is significant number of hypertensive females below 30 yrs in overweight category & a slight rise in hypertensive females above 59 yrs in both overweight & obese categories compared to males. In normal BMI category hypertensive males are more & in overweight category hypertension is more in females [13]. However our study shows hypertensive in all age groups but percentage of hypertensive are found more in males of higher age (≥ 60yrs) & females above middle age (40-59yrs).

Results found in our study in natives of Gujarat state, no lower BMI cutoffs is found for hypertensive as it is observed in other studies carried out in different ethnic population amongst Asians. Reasons may be due to genetic or any environmental factors, social & being vegetarian. Differences in gene & gene environment interactions would be another potential explanation for the differences in the BMI specific prevalence of hypertension. The different genetic backgrounds may interact differently with diverse environmental factors relating to hypertension, such as dietary intakes, physical activity levels, food habits, cultures, religions, demographic characteristics and socioeconomic status, which lead to different prevalence of hypertension. Finally blood pressure is somewhat sensitive to salt intake & we did not have adequate measures of salt consumption in any of the populations. Bell et al mentioned in their study to explain why this ethnic differences in the strength of the BMI-hypertension association exist. They considered genetically determined differences in body composition & metabolic response as well as clustering of risk factors due to differences in social & environmental factors. East Asian populations are known to have greater levels of BMI than Caucasians. They mentioned that Durenberg et al, have observed ethnic differences in BMI at similar levels of percentage of body fat .they found Chinese, Indonesian & Thai populations to have BMI values that were 1.9,3.2 & 2.9 lower than those of Caucasians (American, European, Australian whites analyzed as one group).In other work bell et al found that unmeasured or poorly understood risk factors associated with socioeconomic status were more strongly associated with hypertension in US women than obesity, physical activity & alcohol consumption [11].

In-depth analyses that take into account genetic, individual & environmental factors are still needed to explore the complex association between BMI & related chronic diseases. Further study is needed to test the utility of ethnicity specific BMI cutoffs for defining obesity in clinical settings.

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Role of Magnetic Resonance Spectroscopy in intracranial lesions

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Abstract :

Background: Magnetic Resonance Spectroscopy is a non-invasive imaging technique that studies the chemical activity in the brain and detects the presence of certain chemical substances. Through this imaging technique, images and graphs of the brain can be obtained. **Objective:** The objective of our study was to find out role of MR spectroscopy with routine MRI brain in evaluation of intracranial lesions. **Materials and methods:** During the period of September 2011 to September 2012, a prospective study of 75 patients was carried out. MRI brain was performed on the Phllips Achieva 1.5T using dedicated head coil by taking routine sequences.MR spectroscopy was performed by using point resolved spectroscopy. After deciding the region of interest voxel was kept and 2D multivoxel proton spectroscopy (TR- 1000 msec, TE-144msec, voxel size 20x20 mm) or single voxel proton spectroscopy (TR-1500 msec, TE-35 msec, voxel size 20x20 mm) was performed and spectra obtained. **Results:** Out of 75 patients, majority were between 31 to 50 years with M/F = 2:1. 37 out of 75 patients (49.3%) had neoplastic lesions. Tumors show increased choline in 90% & decreased NAA in 92% cases. In our study, the sensitivity of MRI & MRI+MRS was 89% & 100% for tumors,94 % & 100 % for tuberculosis,100 % each for encephalitis,86 % & 100 % for demyelination,50% & 100 % for toxoplasmosis,57 % & 100% in recurrent/residual changes respectively. Sensitivity of choline/creatine ratio and choline/ NAA ratio for grading of glioma was 100% & 75 % respectively. **Conclusion:** In our study MR spectroscopy with routine MRI brain was more accurate in diagnosis of intracranial lesions.

Key Words: MR spectroscopy, Magnetic Resonance Imaging, Neoplasm

Introduction:

Magnetic Resonance Spectroscopy is a non-invasive imaging technique that studies the chemical activity in the brain and detects the presence of certain chemical substances [1]. Through this imaging technique, images and graphs of the brain can be obtained. The graph patterns are studied to demonstrate evidence of any abnormality in the brain. The frequency information used in MRS is required to determine the chemical composition. A resonance frequency of the atoms is produced which can vary depending on the specific chemical substance, and can be determined with the help of MRS. Since in many pathologic processes, metabolic changes precede anatomic changes during disease progression and treatment, MRS offers a method of early detection of new disease and can influence therapeutic success or failure. The nuclei with an odd number of protons and neutrons such as hydrogen-1, phosphorous-31, carbon-13, fluorine-19 are can be used in MR spectroscopic studies. MRS can be utilized to detect and study disorders that are inflammatory, ischemic, neoplastic or metabolism-associated in nature. It can be used to examine several structures present in the body such as the brain, liver, kidney, prostate and the limbs. However, in human beings, MRS is frequently utilized to study disorders affecting the brain, as other techniques such as biopsy and microscopic studies cannot be performed.

The resonance spectrum identifies metabolites by locating the peak(s), determined by chemical shift (ppm) resulting from the shield formed by the electronic cloud of hydrogen nuclei in the molecules. Water signal suppression is done by CHESS (Chemical shift selective spectroscopy).PRESS (Point resolved spectroscopy) & STEAM (Stimulated echo acquisition mode) sequences are used for single voxel spectroscopy & chemical shift imaging (CSI) is used for multi voxel spectroscopy.

Materials and methods:

During the period of September 2011 to September 2012, a prospective study of 75 patients was carried out. The study group consisted of mainly patients from different parts of Gujarat and also some from the states like Rajasthan and Madhya Pradesh.All patients were seen by appointment.

Inclusion criteria:

1. Patients presented with suspected/ known intracranial pathology.

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2. Patients with positive/ indeterminate MR findings.
3. Patients coming for follow up evaluation of intracranial pathology.

All patients were analyzed by MRI brain and subsequent MR spectroscopy of region of interest. Relevant present and past history was taken. MRI was performed on the Phllips Achieva 1.5T machine using dedicated head coil. Sedation was given whenever necessary. Conventional MR imaging was performed by taking axial T2-weighted, axial and sagittal T1-weighted, fast fluid attenuated inversion recovery (FLAIR) images in coronal plane. Post gadolinium (dose 0.1mmol/kg) enhanced MRI was performed in axial, coronal and sagittal planes in selected cases depending on clinical suspicion and patients affordability. MR spectroscopy was performed by using point resolved spectroscopy. After deciding the region of interest voxel was kept and 2D multivoxel proton spectroscopy (TR- 1000 msec, TE- 144msec, voxel size 20x20 mm) or single voxel proton spectroscopy (TR- 1500 msec, TE-35 msec, voxel size 20x20 mm) was performed and spectrum was obtained. On MR spectroscopy, following metabolites were observed and spectrum was On:

- N-acetyl-asparate (NAA) (molecule present in healthy neurones) at 2.0 ppm
- Creatine/phosphocreatine (Cr) (energy metabolism molecules) at 3.0 ppm
- Choline compounds (Cho) (marker in the synthesis and breakdown of cell membranes) at 3.2 ppm
- Myo-inositol (mI) (only found in glial tissue) at 3.5 ppm
- Lactate (Lac) (anaerobic metabolism): doublet at 1.35 ppm
- Free lipids (Lip): wide resonance, doublet at 1.3 and 0.9 ppm.

Commonly evaluated ratios are: NAA/Cr-1.6-2, NAA/Cho-1.2-1.6, Cho/Cr- 1-1.2.The metabolites were observed in the spectrum and any alteration in form of increase or decrease in above mentioned metabolites was noted.

In case of tumors final diagnosis was obtained by histopathology where possible while in case of non neoplastic lesions final diagnosis was obtained by clinical course and follow up.

Results:

In the present study of 75 patients presented with suspected intracranial pathology or having intracranial lesion, an attempt was made to evaluate correlation between MRI + MRS in evaluation of various intracranial lesions that included tumors and non neoplastic lesions.

In our study the age distribution in intracranial lesions is from 0.5 to 84 years. It is observed that the intracranial tumors and other intracranial lesions are more prevalent in 31-50 year age group with the number of cases being 18 (24%) and 17(22.6%) respectively. In our study, the mean age for intracranial lesions is 36 years. The mean age for tumors is 36.2 years while the same for non-neoplastic lesions is 35.4 years. (Table 1)

Table 1: Age distribution of study subjects

AGE(YRS)	NUMBER OF PATIENTS		TOTAL (%)
	NEOPLASTIC (%)	NON-NEOPLASTIC (%)	
0-10	2 (2.66)	4 (5.33)	6 (8)
11-20	6 (8)	6 (8)	12 (16)
21-30	4 (5.33)	6 (8)	10 (13.33)
31-40	8 (10.66)	10 (13.33)	18 (24)
41-50	10 (13.33)	7 (9.33)	17 (22.66)
51-60	5 (6.66)	1 (1.33)	6 (8)
61-70	2 (2.66)	1 (1.33)	3 (4)
71-80	0 (0)	2 (2.66)	2 (2.66)
81-90	0 (0)	1 (1.33)	1 (1.33)

The observation in our study regarding sex distribution in intracranial lesions is , 51 males (68%) and 24 females (32%) with the ratio of M:F being 2.1:1. In intracranial tumors, there is 24 males and 13 females with the ratio of M: F being 2:1 in case of non-neoplastic lesions, there is 27 males and 11 females with the ratio being 2.5:1.

The lesions were divided into neoplastic and non-neoplastic lesions. The later included tuberculoma (47.3%), demyelination (18.4%), encephalitis(10.5%), toxoplasmosis(5.2%) and others (18.4%) like post ictal edema, cavernous angioma, tuberous sclerosis. 84% of total tumors showed contrast enhancement while 68% of non-neoplastic lesions showed contrast enhancement.

Increase in NAA was seen in a single case of Canavan's disease. Increase in lipid was seen in 95% cases of tuberculoma. (Table 2)

Table 2: Comparison of Levels of Choline, Lipid and NAA between Non-Neoplastic and Neoplastic Lesions

MR SPECTROSCOPY FINDING	NEOPLASTIC LESIONS	NON NEOPLASTIC LESIONS
Increased Choline Level	90 %	55 %
Normal Choline Level	10 %	45 %
Increased Lipid Level	57 %	74 %
Absent Lipid Level	43 %	26 %
Decreased NAA Level	92 %	66 %
Increased NAA	0 %	0.03 %

Table 3 shows comparison between MRI and MRI + MRS; MRI + MRS is more sensitive and specific than MRI for diagnosis of tumors. MRI + MRS is more sensitive but equally specific as compared to MRI for diagnosis of demyelination and toxoplasmosis. However MRI + MRS is equally sensitive and specific for diagnosis of tuberculosis and encephalitis.

Table 3 : Comparison between MRI AND MRI+MRS

PATHOLOGIES	SENSITIVITY		SPECIFICITY		PPV		NPV	
	MRI	MRI + MRS	MRI	MRI + MRS	MRI	MRI + MRS	MRI	MRI + MRS
Tumours	89	100	87	97	87	97	89	100
Tuberculosis	94	94	100	100	100	100	98	98
Encephalitis	100	100	100	100	100	100	100	100
Demyelination	86	100	100	100	100	100	98	100
Toxoplasmosis	50	100	100	100	100	100	98	100

In our study sensitivity, specificity, positive predictive value, negative predictive value of MRI was 57%, 100%, 100% and 95% respectively and of MRI + MRS is 100% in recurrent/residual changes. Sensitivity, specificity, positive predictive value, negative predictive value of choline/creatine ratio for grading of glioma was 100%. In present study sensitivity, specificity, positive predictive value, negative predictive value of choline/ NAA ratio in grading of glioma was 75%, 90%, 75% and 90% respectively (Table 4).

Table 4: Grading of Glioma using CHO/Cr & CHO/NAA Ratios

CHOLINE/CREATINE RATIO	HISTOPATHOLOGY DIAGNOSIS		TOTAL
	LOW GRADE GLIOMA	HIGH GRADE GLIOMA	
<2.2	5	0	5
>2.2	0	10	10
TOTAL	5	15	15
CHOLINE/NAA RATIO	**HISTOPATHOLOGY DIAGNOSIS**		
	LOW GRADE GLIOMA	**HIGH GRADE GLIOMA**	**TOTAL**
<2.2	3	1	4
>2.2	1	10	11
TOTAL	4	11	15

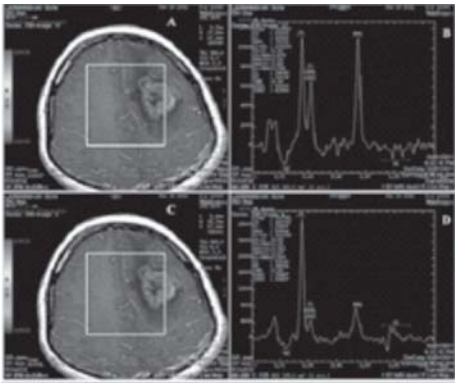

Figure 1: MR spectroscopy in metastasis (A)(B) Ring enhancing lesion with surrounding edema in left parietal region ,voxel in peripheral edema shows normal Cho/NAA ratio. **(C)(D)** voxel in enhancing ring shows elevated Cho,decreased NAA and decreased Cr with increased Cho/NAA ratio(3.43).

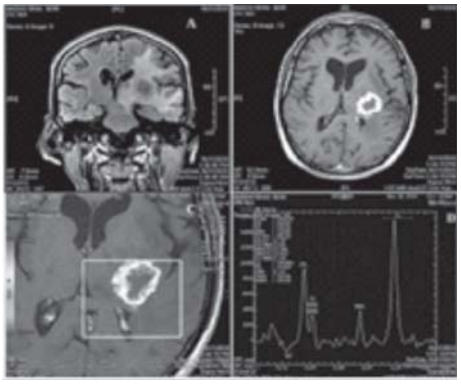

Figure 3: MR spectroscopy in tuberculoma. (A) (B) Ring enhancing lesion with edema in left parietal region.**(C)(D)** voxel in (C) shows elevated lipid lactate,increased Cho with decreased NAA.

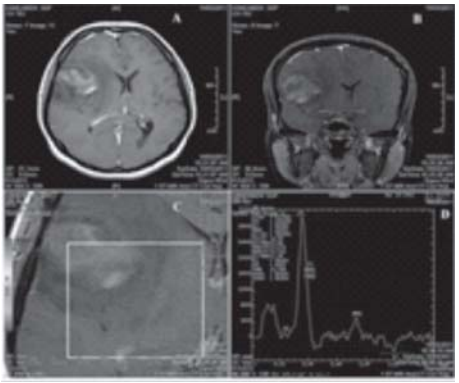

Figure 2: MR spectroscopy in Glioblastoma multiforme.(A)(B) Heterogeneously enhancing lesion with necrosis & edema in right parietal region **(C)(D)** voxel in lesion shows elevated Cho, decreased NAA with increased Cho/NAA ratio and Cho/Cr ratio with reversed lipid-lactate peak.

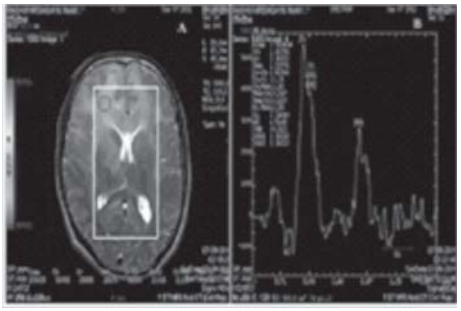

Figure 4: MR spectroscopy in encephalitis.(A) Hyperintense lesions in the B/L frontoparietal cerebral white matter,genu and right internal capsule. **(B)** voxel in (A) shows reduced NAA relative to Cr and an increase in the Cho peak, and the presence of a double inverted lipid-lactate peak.

Discussion:

DISTRIBUTION OF NON-NEOPLASTIC LESIONS: In our study, among non-neoplastic lesions, tuberculous lesions are most common constituting about 47% of cases followed by demyelination (18.4%) cases followed by encephalitis (10%) and toxoplasmosis (5.2%) .

CONTRAST ENHANCEMENT: In our study 31 of 37 tumors (84%) showed contrast enhancement. According to Zohu ZR et al [2] 98 to 104 cases showed contrast enhancement. This difference could be due to significant difference in the size of sample in both studies.

INCREASE IN CHOLINE: In our study, the choline is increased in 90% of tumors. In the study by Poptani H et al [3], the choline is increased in all 100% of tumors. This variation could be due to decrease in choline in cases of glioblastoma multiforme as a result of necrosis [4]. Increase in choline is also not seen in case of pineal germinoma which is consistent with the findings of Panigraphy et al [5]. In our study, the choline is increased in 55% of non neoplastic lesions.

DECREASE IN N-ACETYL ALANINE : In our study, NAA is decreased in 92% of neoplastic pathologies. All neoplastic conditions other than DNET shows reduced NAA. According to Brandao LA [6], reduction in NAA is typically observed in tumors indicating decreased viability and number of neurons. According to Ott D et al [7], NAA is decreased in cases of Glioma, meningioma and metastasis. According to Saindane AM et al [8], NAA is decreased in all Neoplasms that cause the neurons to be displaced or replaced with malignant cells. In the study done by Poptani H et al [3], there is decrease or absence of NAA in all cases (100%) of glioma, lymphoma and metastasis. They stated that NAA is a neuronal marker and decreases in all tumors because of the invasiveness of tumor cells within the normal tissue. In our study, NAA is decreased in 66% cases of non neoplastic lesions and is increased in single case of canavan's disease.

INCREASE IN LIPID: In our study, lipid is increased in 57% cases of tumors. In the study done by Krouwer HG et al [9], lipid peak was elevated in 83% of cases. In the study done by Poptani H et al [3], there is elevation of lipid in all cases of metastasis and most cases of high grade glioma while it is absent in all cases of low grade glioma. The variation in the findings in our study and above mentioned studies could be due to variation in the proportion of cases of high and low grade glioma included in the study. In our study, lipid is increased in 17 of 18 cases (95%) of tuberculoma. In the study done by Poptani H et al [3], lipid is increased in all cases (100%) of tuberculoma. This correlates with our study.

GRADING OF GLIOMA: In our study, we have used Cho/Cr ratio of 2.2 as a cut off for grading gliomas in low and high grade and it is 100% sensitive and specific respectively while choline/NAA ratio of 2.2 as a cut off is 75% sensitive and 90% specific. In a study by Zeng Q [10] of 39 patients suspected of having gliomas, the Cho/Cr and Cho/NAA ratios were significantly higher in high-grade than in low-grade glioma (P<.001), whereas the NAA/Cr ratios were significantly lower in high-grade than in low-grade glioma (P<.001). A threshold value of 2.04 for Cho/Cr ratio provide sensitivity, specificity, PPV and NPV of 84.00%, 83.33%, 91.30% and 71.43%, respectively. Threshold value of 2.20 for Cho/NAA ratio resulted in sensitivity, specificity, PPV and NPV of 88.00%, 66.67%, 84.62% and 72.73%, respectively.

INTRACRANIAL TUMORS: MRI AND HISTOPATHOLOGY/FOLLOW-UP CORRELATION IN 75 CASES

In detection of intracranial tumors with the help of MRI, the true positive results were obtained in 33 (87%) and false positive results were obtained in 5 (13%) cases. In our study, the sensitivity & specificity of MRI in tumor are 89% and 87% respectively. The positive predictive value & negative predictive value are 87% and 89% respectively. In study by Al-Okaili RN et al [11], sensitivity, specificity, positive predictive value & negative predictive value of MRI were 95%, 67%,91% &86% respectively. The results are almost similar except specificity which is higher in our study.

INTRACRANIAL TUMORS: MRI +MRS AND HISTOPATHOLOGY/FOLLOW-UP CORRELATION IN 75 CASES: In our study, in detection of intracranial tumors with the help of MRI and MRS, the true positive results were obtained in 37 (97%) and false positive results in 1(3%) of cases. False negative cases were 0 suggesting that MRI with MRS can be used to exclude the possibility of a tumor in all doubtful cases with very high confidence. The sensitivity & specificity or MRI + MRS in tumor are 100%

and 97% respectively. The positive predictive value & negative predictive value are 97% and 100% respectively. In study by Rand SD et al [12], sensitivity, specificity, positive predictive value & negative predictive value of MRI were 85%, 74%, 92% and 61% respectively. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy are more in our study as compared to others. This could be due to use of multivoxel spectroscopy technique or due to small sample size in our study. In addition, we have taken both MRI and MRS for the diagnostic consideration that enhances the accuracy of diagnosis as compared to MRS alone.

Conclusion:

MR spectroscopy in patients with intracranial lesions can differentiate neoplastic from non-neoplastic with a high diagnostic accuracy. MR spectroscopy together with MR Imaging achieves a higher diagnostic accuracy then MR spectroscopy alone.

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A Comparative study of two different methods of microbiological surveillance of Operation theaters

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Abstract :

Introduction : Prevalence of air borne Nosocomial infection is a major attribute to morbidity and mortality in immunocompromised patients. Two methods are commonly used for measurement of bacterial density in hospital environment particularly Operation theater. **Method & materials:** Air samples from conventionally ventilated operating rooms and intensive care units were taken simultaneously by the sedimentation method (settle plate) and with the HiAir petri air sampler. Bacterial density was calculated in form of colony forming unit (cfu). The isolated bacteria were identified by conventional methods. **Result:** The investigations showed that the number of colony forming units per cubic metre obtained with the sedimentation method was, on an average, higher than those found with the HiAir petri air sampler from the same area. The most common isolate from settle plate method was Bacillus subtilis (54.91%) followed by Pseudomonas aeruginosa (38.09 %), Co-agulase negative staphylococcus (30.12%), Klebsiella pneumoniae (25.85%), Acinetobacter baumanii (23.12 %), Escherichia coli (10.22 %), Staphylococcus aureus(8.32%) and Proteus mirabilis(2.72%). **Conclusion:** Settle plate method was found to be more informative than the air sampling system for bacteriological analysis of air in present study.

Key Words: Air sampling; settle plate method, Air sampler

Introduction :

Nosocomial infections transmitted by the airborne route are a major source of morbidity and mortality in immunocompromised patients [1]. The prevalence of wound infection by air borne pathogens is more common in two special settings, the operating room and the wards for burned patients. A linear relationship between air counts of bacteria in operating rooms and surgical site infection or wound contamination rate has been reported by many investigators.[2 6] A 13-fold reduction in bacterial density in the operating room would reduce the wound contamination by about 50%.[7] The microbiological quality of operation theatre air is one of the significant parameter affecting incidence of surgical wound infection. [8]

Bacteriological analysis of air by air sampling in hospital environment can be helpful in prevention and control of Nosocomial infections. In an outbreak of airborne Nosocomial infection, it provides good information which can be helpful for formulation of control measures. Although routine air sampling is not indicated, it would be appropriate to monitor hospital air quality in critical areas, such as operating rooms and intensive care units. The aim of the present study was to compare two different methods of microbiological surveillance of hospital air and to assess the utility of the Hiair petri air sampler (HIMEDIA) for monitoring air contamination in the hospital environment.

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Methods :

Air samples were collected from eight different conventionally ventilated operating rooms and three different intensive care units. Air samples from each of the investigated rooms were taken once in a month over a period of a year; & following two methods were used simultaneously for air sampling.

1. The Hiair petri air sampler loaded with blood agar plate. Sampling time: 200 seconds (Air sample volume: 1000 litres)
2. The sedimentation method with air exposed plate kept for 1hour, 1meter above the floor & 1 meter from the wall. [9]

All of the air samples were obtained from an empty Theatre. The plates were transported to the laboratory and incubated at 37^0C for 2 days. After incubation the colonies were counted. The identification of isolated strains was performed by standard staining methods and biochemical reactions.

With Hiair petri air sampler method, concentrations of airborne bacteria are calculated as colony forming units per cubic meter (CFU/m3). It is counted according to the following equation:

Bacterial load (B) = 1000N/RT [10]
N number of colonies on the plate;
R rate of air sampling in liters/min
T - duration in minutes

For settle plate method formula used is number of bacteria settling on 1 square meter of medium per minute = number of such particles per 0.3 cubic meter of air[10]

Results :

The sedimentation method revealed magnitude of air contamination was varied from Minimum 32 CFU/m3 in Orthopedic Operation Theater & up to 88 CFU / m3 in Post partum unit (Graph1); & magnitude of air contamination detected by Hiair petri air sampler method was as low as 21 CFU / m3 in Orthopedic OT to 40 CFU/m3 in Post partum unit. (Graph2).

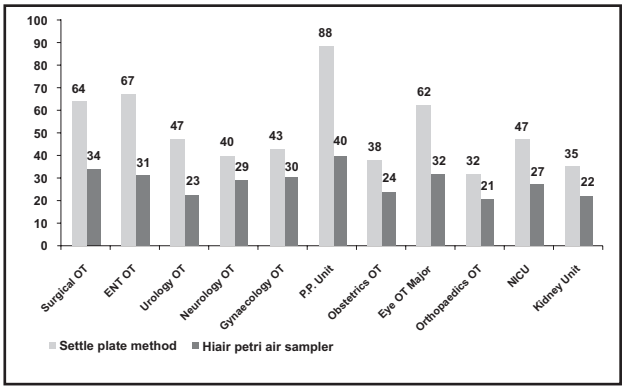
The air samples collected from eight operation theaters and three different intensive care units at interval of one month from the period of July 2010 to June 2011 for bacteriological analysis. Table 1 shows comparison between Numbers of Colony forming units obtained by air sampling system Vs settles plate method. On applying independent sample t test (unpaired student t test two tailed) it was found that at almost all locations, the p vale was < 0.0001 means statistically highly significant difference was there between two different methods. As it is obvious from the data that settle plate method has high yield, it was found statistically proven better method than air sampling method.

The most common micro-organism isolated from settle plate method was Bacillus subtilis (54.91 %) which is considered as a common environmental contaminants. Amongst the pathogenic bacteria, the most common isolate was Pseudomonas aeruginosa (38.09 %) followed by Co-agulase negative staphylococcus (30.12%), Klebsiella pneumoniae (25.85%), Acinetobacter baumanii (23.12 %), Escherichia coli (10.22 %), Staphylococcus aureus(8.32%) and Proteus mirabilis(2.72%).

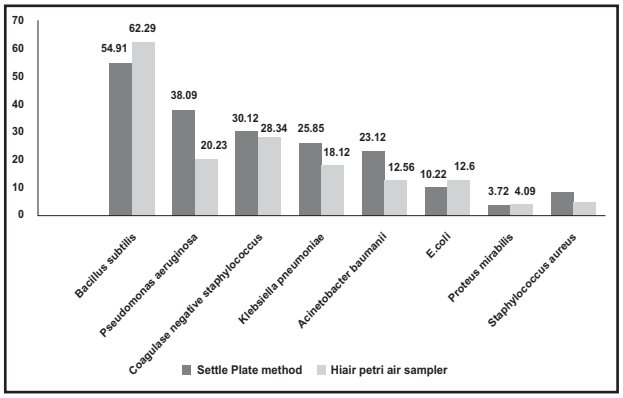
The most common micro-organism isolated from Hiair petri air sampler was Bacillus subtilis (62.29 %). Other isolates were Co-agulase negative staphylococcus (28.34 %), Pseudomonas aeruginosa (20.23 %), Klebsiella pneumoniae (18.12%), Acinetobacter baumanii (12.56 %), Escherichia coli (12.6 %), Staphylococcus aureus(4.9%) and Proteus mirabilis(4.09%).

Table 1: Comparison between Numbers of Colony forming units obtained by air sampling system Vs settles plate method

Name	Method	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Mean value	t-test	P value
Surgical OT	air sampling system	30	29	37	33	39	28	44	48	30	32	25	31	34	8.177	<0.0001
	settles plate method	45	58	67	54	51	60	70	74	65	83	72	68	64		
ENT OT	air sampling system	28	30	33	29	35	37	39	35	26	22	32	29	31	8.41	<0.0001
	settles plate method	50	55	53	49	69	64	58	73	78	89	80	82	67		
Urology OT	air sampling system	21	28	30	28	19	17	25	22	23	23	20	17	23	9.882	<0.0001
	settles plate method	63	48	42	51	44	45	50	39	58	37	44	47	47		
Neurology OT	air sampling system	29	28	28	36	30	31	29	33	26	26	21	28	29	-4.399	0.0002
	settles plate method	32	35	39	35	48	54	32	50	30	37	46	40	40		
Gynaecology OT	air sampling system	27	35	30	27	30	37	32	28	29	30	24	29	30	-5.209	<0.0001
	settles plate method	40	28	51	55	34	39	45	53	42	42	48	38	43		
P.P. Unit	air sampling system	30	56	50	44	35	34	38	35	33	40	46	38	40	-17.67	<0.0001
	settles plate method	92	85	78	83	90	89	96	81	87	93	85	90	88		
Obstetrics OT	air sampling system	18	16	28	20	26	20	30	17	32	22	35	24	24	-4.837	0.0001
	settles plate method	26	39	35	48	47	50	32	38	30	29	42	40	38		
Eye OT	air sampling system	29	53	56	33	30	21	25	28	30	31	22	29	32	-7.626	<0.0001
	settles plate method	56	59	68	60	63	46	70	68	65	57	55	72	62		
Orthopaedics OT	air sampling system	10	25	28	25	21	14	18	31	21	23	15	19	21	-5.134	<0.0001
	settles plate method	35	39	31	26	25	29	30	28	33	38	37	37	32		
NICU	air sampling system	28	25	21	40	19	32	27	23	25	38	25	21	27	-7.188	<0.0001
	settles plate method	53	48	44	38	57	60	41	37	45	45	48	48	47		
Kidney Unit	air sampling system	15	18	16	25	31	16	20	22	29	27	17	21	22	-5.504	<0.0001
	settles plate method	34	35	38	23	27	35	40	44	37	32	28	41	35		



Graph 1: Mean number of Colony forming units obtained by two different methods.



Graph 2: Percentage of isolates obtained by two different methods.

Discussion :

The quality of indoor air in terms of bacterial density and bacteriological profile depends on external and internal sources, such as ventilation, cleaning procedures, the surgical team and their movements in and out of Operating room. So, bacteriological profile reflects that which control measures are lacking in the present area.

The investigations show that the CFU/m3 values obtained with the sedimentation method were on average higher than those measured with the Hiair petri air sampler. Whyte et al. [2] also suggested that settle plates showing bacterial surface contamination represents a more relevant indicator of the wound contamination rate than air counts. There are some advantages of settle plate method like it is cheap, easily available, multiple samples can be taken at the same time and it does not disturb air flow. Settle plates are sterile, economical and readily available. Many places in an environment can be checked at the same time. The natural trend of the microbial population in the air is not disturbed during the sampling time nor is the laminar air flow interrupted in any way. Settle plates give the measurement of the harmful part of the airborne population which falls on to a critical surface in a given time. Settle plates allow the evaluation of surface contamination settling from the air. [11]

Conclusion :

The bacteriological quality of air in the Operation Theater and intensive care units reflects the effectiveness of infection control measures in the hospital. The settle plate method was found statistically proven better method than air sampling method for bacteriological analysis of air in these areas.

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Miliary tuberculosis revisited A r eview article.

Shruti Sangani*, Nilima Shah**, Sonal Ginoya, Samira Parikh*******

Abstract :

The fight between human race and Mycobacterium tuberculosis is far from over and the relentless fight against this organism is still going on globally. India is the highest TB burden country accounting for one fifth (21%) of the global incidence (Global annual incidence estimate is 9.4 million cases out of which it is estimated that 2 million cases are from India). India is 17th among 22 High Burden Countries in terms of TB incidence rate. Tuberculosis continues to afflict the human race not only due to its effects as a medical malady, but also by its impact as a social and economic tragedy as it generally involves people from productive age group. Here we report a case of disseminated tuberculosis and review the literature in brief.

Key Words : Tuberculosis meningitis, multiple intracranial tuberculoma, miliary tuberculosis, ocular tuberculosis, disseminated tuberculosis.

Introduction :

India is 17th among 22 High Burden Countries in terms of TB incidence rate. [1]Miliary tuberculosis, also known as "disseminated tuberculosis", is characterized by widespread dissemination of Mycobacterium tuberculosis via lymphohematogenous spread into the human body and by the tiny size of the lesions (1 5 mm). John Jacob Manget described a form of disseminated TB in 1700 and named it military TB (derived from the Latin word Miliarius, meaning related to millet seeds). [2] Miliary TB may infect any number of organs, including the lungs, liver, spleen and brain. It is a complication of 1 3% of all TB cases.[3,4] Up to 25% of patients with miliary TB may have meningeal involvement. In addition, miliary TB may mimic many diseases. Prompt diagnosis of this disorder is important because early treatment results in better clinical improvement.[5,6]

Case Report :

A 35 year old male had presented to Emergency Department with chief complaints of single episode of convulsion and high grade fever. On further inquiry it was found that patient was relatively well before 3 months. Then he started having intermittent low grade fever with dry cough accompanied by generalized weakness and anorexia. Patient had not sought any medical advice for his fever but it was a single episode of generalised tonic clonic convulsion, high grade fever with altered mental status which brought him to emergency department. There was no history of headache, vomiting, visual disturbances, breathlessness, chest pain, palpitation or any other significant complaints.

On presentation, the patient was irritable but oriented to time, place and person. He had mild pallor, no lymphadenopathy. His hemodynamic parameters were within normal range. On CNS examination patient was irritable with presence of terminal neck rigidity. Tendon reflexes were exaggerated with extensor plantar reflexes. Per abdomen examination revealed hepatospleenomegaly. No other abnormalities were detected in rest of systemic examination.

In haematological profile patient had hemoglobin 9.8 g/dl with MCV 74 fl, total WBC count 14700/cu mm with differential count 86/10/2/2 and platelet count 1.61 lakhs/cu mm. His biochemical profile was within normal limits and his HIV status (by ELISA) was negative.

Emergency management was done in form of Inj. Phenytoin (loading dose), antibiotics and supportive therapy. His fundus examination revealed soft exudates and choroiditis. CSF examination, done before starting antibiotics, showed no abnormality so his further investigations were planned.

The Chest Xray showed bilateral miliary mottling. USG abdomen showed hepatospleenomegaly with normal echotexture. His MRI Brain with contrast revealed multiple ring enhancing lesions in bilateral cerebral hemispheres suggestive of tuberculomas and abnormal leptomeningeal

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and basal meningeal enhancement suggestive of tuberculous meningitis. His 2D Echocardiography was normal. His Sputum and Blood culture did not reveal any growth of organisms.

Antitubercular drugs were started in form of isoniazid 10mg/kg, rifampicin 10mg/kg, pyrazinamide 35mg/kg, streptomycin 15mg/kg IM 3 times in a week (as per DOTS) & pyridoxine.

Patient attained normal sensorium within 3 days and became afebrile in 5 days. He did not have any episode of convulsion after admission. He was successfully discharged from hospital and was advised to continue antitubercular drugs and regular follow up.

Discussion :

Disseminated TB refers to concurrent involvement of at least two noncontiguous organ sites of the body, or, involvement of the blood or bone marrow by TB process.[7,8,9] Our patient had involvement of lungs, central nervous system and eye and hence can be defined as disseminated TB.

For a long time, miliary TB has been considered to be a childhood disease. However, during the last three decades, it is increasingly being recognized in adults as well. Conditions predisposing to or associated with disseminated and miliary tuberculosis are but not limited to childhood infections, malnutrition, HIV infection and AIDS, alcoholism, diabetes mellitus, chronic renal failure/ heamodialysis, post surgery (gastrectomy), organ transplantation, drugs like steroids, immunosuppresants and immunomodulators, connective tissue disorders, pregnancy, postpartum period, underlying malignancy and silicosis .[6]

The clinical manifestations of miliary TB in adults are nonspecific and can be obscure till late in the disease. Patients with miliary TB classically present with fever with evening rise of temperature of several weeks duration, anorexia, weight loss, weakness and cough. [6,10] Occurrence of daily morning temperature spike is reported to be characteristic of miliary TB. [11] However, fever may be absent and the patients may present with progressive wasting strongly mimicking a metastatic carcinoma (cryptic miliary TB). Chills and rigors, described in patients with malaria, or, sepsis and bacteraemia, have often been described in adult patients with miliary TB. [6,10] Night sweats are common. Since miliary TB can involve many organs, patients present with symptoms and signs referred to various organ systems. Cutaneous lesions may offer a valuable clue to the diagnosis of miliary TB. These include erythematous macules and papules (tuberculosis miliaria cutis). [6] Choroidal tubercles, when present, provide a valuable clue to the diagnosis of miliary TB. The presence of choroidal tubercles is considered to be pathognomic of miliary TB. [6,10] Choroidal tubercles are bilateral, pale, gray-white or yellowish lesions usually less than one quarter of the size of the optic disc and are located within 2 cm of the optic nerve. A systematic ophthalmoscopic examination is recommended after mydriatric administration in all patients with suspected miliary TB. TB meningitis (TBM) has been described in 10 to 30 per cent adult patients with military TB and about one-third of patients presenting with TB meningitis have underlying miliary TB. [12] Before the advent of modern imaging modalities, such as CT, MRI and echocardiography, clinically evident cardiac or renal involvement was seldom documented in patients with miliary TB. Overt adrenal insufficiency manifesting as Addison's disease at initial presentation or during anti-tuberculosis treatment has also been described in miliary TB. [13,14]

The differential diagnosis of miliary tuberculosis includes acute respiratory distress syndrome, addison disease, ascites, blastomycosis, cardiac tamponade, disseminated intravascular coagulation, epididymal tuberculosis, hypersensitivity pneumonitis, pneumocystis carinii pneumonia, bacterial pneumonia, community-acquired pneumonia, fungal pneumonia and viral pneumonia. Other problems to be considered are fungal infection, histiocytosis X (Langerhans cell histiocytosis), HIV-related pulmonary opportunistic infections, lymphangitic spread of cancer, measles, pancreatic abscess, pulmonary alveolar microlithiasis and talc granulomatosis.

The diagnosis of miliary TB can be difficult as the clinical manifestations are non-specific, the chest radiographs do not always reveal the classical military changes and patients may present with complications thus distracting the clinicians. Therefore, a high index of clinical suspicion and a systematic approach to diagnostic testing is required to establish the diagnosis of miliary TB.

Various hematological, microbiological, biochemical and radiological investigations can be performed to make diagnosis of military TB. Patient's hematological profile may reveal anemia, leucopenia or leucocytosis and thrombocytopenia or rarely thrombocytosis. Leukemoid reactions may occur. The erythrocyte sedimentation rate is elevated in approximately 50% of patients. Elevated levels of transaminases suggest liver involvement or, if treatment has been initiated, drug toxicity. In approximately 30% of cases, alkaline phosphatase levels are elevated. A decrease in sodium levels may correlate with disease severity, and the syndrome of inappropriate secretion of antidiuretic hormone (SIADH) or hypoadrenalism may complicate tuberculosis (TB).

Cultures of the sputum, blood, urine, or cerebral spinal fluid can help diagnosis. Sensitivity testing is essential for all positive isolates, and consider investigation for multidrug-resistant TB (MDR-TB) in all cases. Negative sputum smear results (even 3 negatives) do not exclude the possibility of TB. Polymerase chain reaction can be considered when in doubt. Lumbar puncture should be considered, even with normal brain MRI findings. It may reveal leucocytosis with lymphocytic predominance (70%), elevated CSF lactic acid levels, elevated protein levels (90%), low glucose levels (90%) and acid-fast bacilli. The tuberculin skin test with purified protein derivative (PPD) often yields negative results in patients with miliary TB. This may be explained by the large number of TB antigens throughout the body. Negative tuberculosis skin testing results do not exclude the possibility of TB.

Radiological investigations like Chest X ray, CT scan of chest/abdomen/head, ultrasound examination of abdomen, echocardiography and MRI imaging can be chosen depending upon the site of involvement with varying degree of sensitivity and specificity. Causes of miliary mottling of lung fields on Chest X ray are several, of which tuberculosis, fungal diseases (histoplasmosis), malignancy (metastatic, alveolar cell carcinoma, lymphoma), pneumoconiosis, sarcoidosis and interstitial fibrosis (subliminal honeycombing) are common. Rare causes include histiocystosis X, amyloidosis, rheumatoid arthritis, hemosiderosis (due to mitral stenosis). Typical military mottling is seen in only up to 50% of cases of disseminated TB.

Patients with military TB and CNS involvement can sometimes present with a normal CSF profile and absence of neurological signs. Such cases are usually diagnosed by the findings on neuroimaging. [15,16] The CT/ MRI of the brain may reveal thickening and enhancement of basal meninges, hydrocephalus, infarction, oedema (often periventricular) and mass lesions due to associated tuberculoma/ cerebral abcess. In case of multiple intracranial tuberculomas, ring enhancing lesions may be seen on MRI with contrast. The MRI is superior to CT in detection of diffuse and focal meningeal granulomatous lesions, focal infarcts of the basal ganglia and diencephalon and in defining the presence, location & extent of associated brainstem lesions. Differential diagnosis to multiple ring enhancing lesions on MRI include glioblastomas, low-grade gliomas, lymphomas and brain metastasis, tuberculosis, cysticercosis, demyelinating disorders, pyogenic abscess, toxoplasmosis, fungal infections, neurosyphilis, sarcoidosis, Behcet disease, radiation encephalopathy, cerebral venous thrombosis and several other vasculitic disorders.

Additional tests and procedures for miliary tuberculosis include funduscopy to reveal retinal tubercles, fiberoptic bronchoscopy to obtain cultures (bronchoalveolar lavage), transbronchial biopsy, bone marrow biopsy,liver biopsy, laproscopy to obtain tissue and material for culture.

The treatment is same as per RNTCP protocols. The Revised National TB Control Programme (RNTCP), based on the internationally recommended Directly Observed Treatment Short-course (DOTS) strategy, was launched in 1997 expanded across the country in a phased manner with support from the World Bank and other development partners. The objectives of the programme are to achieve and maintain cure rate of at least 85% among New Sputum Positive (NSP) patients and to achieve and maintain case detection of at least 70% of the estimated NSP cases in the community.

According to RNTCP guidelines new cases of extrapulmonary tuberculosis or smear negative pulmonary cases should be treated as category 1 which includes antitubercular drugs Isoniazide, Rifampicin, Ethambutol (Streptomycin) and Pyrazinamide for first 2 months (intensive phase) and then after Isoniazide and Rifampicin for next 4 months (continuation phase). In case of TBM streptomycin is used in place of ethambutol and the

continuation phase is continued for total 7 months. Possible indications of corticosteroids in TBM are cerebral oedema, hydrocephalus, infarcts, opticochiasmatic pachymeningitis. The recommended dose of Prednisolone is 0.75-1 mg/kg/day in adults. Treatment for intracranial tuberculoma is antitubercular drugs except large lesions producing midline shift and severe intracranial hypertension/ expanding lesions during antituberculosis therapy when surgery is needed. Usually tuberculomas begin to decrease in size within the first two months of therapy. Paradoxical expansion of intracranial tuberculomas during antituberculosis therapy has also been observed. [17,18] And hence regular follow up is essential.

If left untreated, the mortality associated with miliary tuberculosis is assumed to be close to 100%. With early and appropriate treatment, however, mortality is reduced to less than 10%. The earlier the diagnosis, the better the likelihood of a positive outcome. Early treatment for suspected TB has been shown to improve outcome.

Conclusion :

Miliary TB is common in India. Because the clinical features of the disease are nonspecific, a high index of suspicion is essential for early diagnosis in order avoid delays in therapy and poor outcome.

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Excellent response to oral acitretin in cutaneous ulcerative Lichen Planus

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Abstract :

Introduction: Lichen planus (LP) is a dermatosis of unknown etiology. Various morphologic types have been described. Erosive and ulcerative variety is more common in oral cavity. Cutaneous ulcerative variety is rare- described over palms & soles.

Case report : A 45 year old female patient with a completed family presented with multiple, well defined, hypertrophic, lichenified, violaceous, tender lesions surrounded by a hyperpigmented rim and surmounted with ulcer. Erosions and white lacy pattern were present in oral mucosa. All routine reports were normal. Histopathology was consistent with clinical diagnosis. Patient was started with oral acitretin 50 mg daily along with topical antibiotics for ulcers. Within two weeks all ulcers subsided including tenderness.

Discussion : only few anecdotal reports of response of acitretin in ulcerative LP have been there. So we report this case because of its rarity and a new modality of treatment which can also be helpful in other types of LP.

Key Words : oral acitretin, cutaneous erosive lichen planus.

Introduction :

Lichen planus (LP) is an idiopathic inflammatory disease of the skin and mucous membranes. Cutaneous LP has been reported to affect from 0.22% to 1% of the adult population. The characteristic primary lesion of LP is a small, polygonal-shaped, violaceous, flat-topped papule; some papules are umbilicated. The surface is slightly shiny or transparent, and 'wickham's striae' or small gray white puncta are also seen. Histologically, a dense, band-like lymphocytic infiltrate is seen underlying an acanthotic epidermis with hypergranulosis, apoptosis, and destruction of the basal cell layer. Ulcerations can occur within palmo-plantar lesions of LP, particularly those on the soles. [1] Although palm plantar LP is more common in men than in women, ulcerative LP prevails in female patients.[2] The ulcers are intensely painful and often recalcitrant to conventional therapy. Chronic ulcerative lesions are at risk of developing squamous cell carcinoma. Well-described therapies for LP include topical, intralesional and systemic corticosteroids, retinoids, narrowband UVB, PUVA, topical calcineurin inhibitors, and, for severe or treatment-resistant cases, oral cyclosporine. Acitretin is second generation oral retinoid. It is FDA approved for the treatment of pustular psoriasis. Lichen planus is being an off-line indication. There have been very few reports of its utility in erosive cutaneous LP. Acitretin is the only systemic retinoid that has a relatively good level of evidence regarding its efficacy in the treatment of cutaneous LP. [1] Excision and skin grafting should be considered when conservative therapy is ineffective.[3]

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Case report :

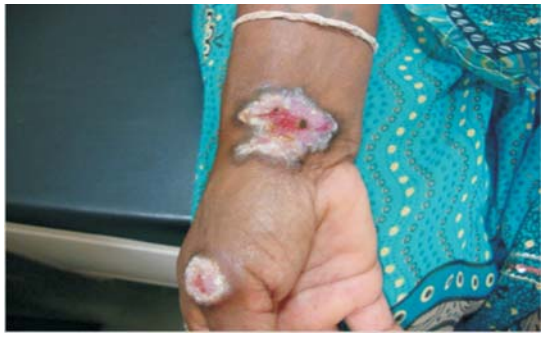
A 45 year old female patient with a completed family presented with multiple, well defined, hypertrophic, lichenified, violaceous, tender lesions surrounded by a hyperpigmented rim and surmounted with ulcer (photograph 1). Erosions and white lacy pattern were present in oral mucosa. Clinically we put the differential diagnosis of cutaneous ulcerative LP or discoid lupus erythematosus. All routine reports including serum lipid profile and liver function tests were normal. Histopathology showed loss of epidermis at place, hypergranulosis, saw toothing of rete ridges, basal cell liquifaction with interface dermatitis with lymphocytic infilterate (photograph 2). Patient was started with oral acitretin 50 mg daily along with topical antibiotics for ulcers. Within two weeks all ulcers subsided including tenderness (photograph 3).

Discussion :

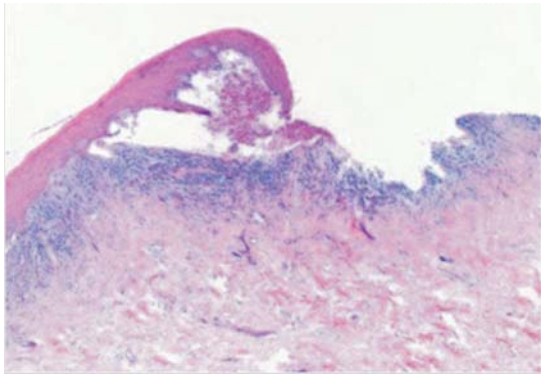
Erosive LP is difficult to treat and it relapses after stopping the treatment. Only few anecdotal reports of response of acitretin in ulcerative LP have been reported. Henderson RL [4] et al has reported a case of cutaneous ulcerative lichen planus exhibiting pathergy and its response to acitretin. We report this case because of its rarity and a new modality of treatment which can also be helpful in other types of LP.

We started the patient on 50 mg daily single dose for one month then we tapered the dose to 25 mg after four week. Our patient is still on maintenance therapy on 25 mg acitretin daily for last 4 months and patient is still in remission. Patient was not given any other topical treatment and oral treatment except oral anti-histaminics. We are monitoring the patient and will continue our follow up for the relapse in future.

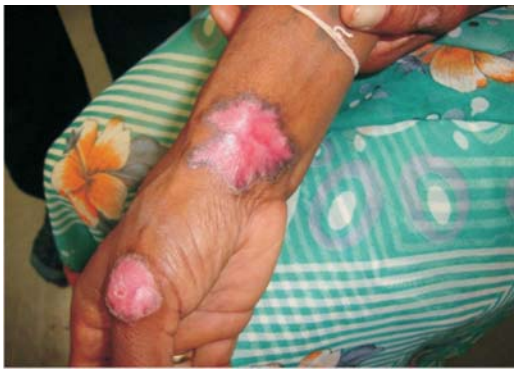
Whats new? : Oral retinoides especially acitretin has been claimed effective in lichen planus. But oonly few reports of its use on cutaneous erosive lichen planus are there. So we are reporting this case and further controlled randomised trial should be done to prove its efficacy.



Photograph 1: Two well defined hypertrophic centrally ulcerated lesions over right forearm.



Photograph 2: H & E stain of lesional biopsy



Photograph 3: 2 weeks post treatment showing healing of ulcers.

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A rare case of large benign serous cyst adenofibroma of ovary in postmenopausal woman

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Abstract :

Surface epithelial tumors are most common neoplasms of ovary. Serous cyst adenofibroma is a rare ovarian tumour which is benign in nature. We present a case of serous cystadenofibroma in postmenopausal woman which appeared malignant clinically, on imaging and perioperatively.Tumor was removed by laparotomy and frozen section revealed a rare ovarian neoplasm namely benign serous cystadenofibroma having both solid and cystic components.

Key Words : serous cystadenofibroma, serous neoplasms, ovary

Introduction :

Surface epithelial tumor are the most common neoplasms of the ovary, encompasses five distinct subtypes, namely, serous, mucinous, endometrioid, clear cell and transitional cell along with combination of these types[1] Tumors with serous differentiation represent 46% of all surface epithelial ovarian neoplasms of which 50% are benign serous tumors[2] . Sex-cord stromal tumors account for approximately 8% of all ovarian tumors, of which fibromas account for approximately half of the cases [3]. The combination of these two is rare. Serous tumor with a solid, fibrous component is designated as distinct entity of serous cystadenofibroma in which cystic and fibrous components are closely intermixed. These tumors occur at all ages with a peak in the perimenopausal age and are mostly benign.

We present a rare case of large ovarian tumor presented in a postmenopausal woman which appeared to be malignant clinically, on imaging and perioperatively. However, microscopy revealed benign serous cystadenofibroma of ovary.

Case report :

Mrs.XYZ, 65 years old presented with chief complains of abdominal pain since 1 month.She had 7 full term normal deliveries and tubal ligation was done .She had attained menopause 30 years back. On general examination, she was fairly built and nourished. Her pulse was 88per minute and B.P. was 190/90mmHg. On abdominal examination-large cyst up to umbilicus was palpable which was partly mobile. On per vaginal examination, uterus was

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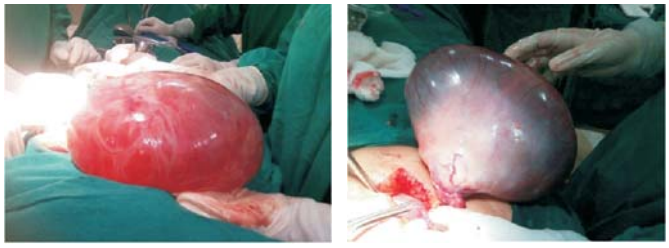
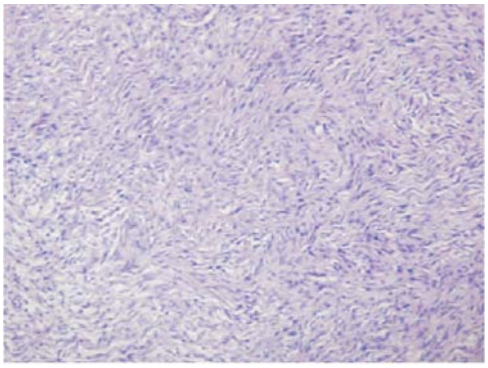
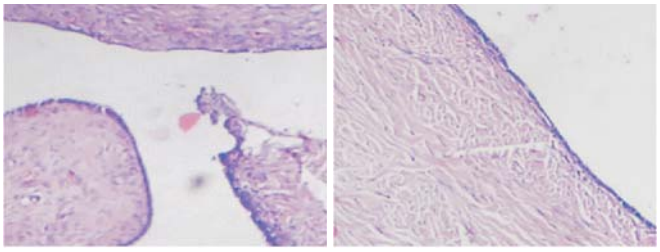


Photograph 1& 2:
Gross appearance of ovarian tumour



Photograph 3:
H & E stain of the solid part; 40x magnification



Photograph 4 & 5:
H & E stain of cystic part; 40x magnification

retroverted, small in size. Clinical diagnosis was of a large ovarian cyst in post menopausal woman. Her hemoglobin was 10.8gm%, blood group was O+ve, hepatic and renal function tests were normal. Her CA-125 was 75.4u/ml. Her ECG was showing LVH, 2DEcho showed concentric LVH, reduced LV compliance and LVEF was 67%.

Imaging studies showed large ovarian cyst on right side measuring 178 x 108 mm in size with solid and cystic components and septations indicating high possibility of malignant ovarian tumour. Uterus was small in size, left ovary and rest of abdomen was normal. Antihypertensives were started and with medical fitness patient was taken for surgery. Intraoperatively, The cyst was uniloculated, approximately 20x16x14cm in size; outer surface showed congested vessels & base was made up of solid white tissue (photograph 1& 2). With the suspition of malignancy, frozen section was demanded, cyst was surprisingly found to be benign serous cystadenofibroma in report. Meanwhile total abdominal hysterectomy with bilateral salpingo-ooprorectomy was done.

Histologically, the tumor showed glands and cysts scattered together in a fibroblastic stroma.This stromal component appeared grossly as firm white or grayish area. High power view of H& E stain showed cystic areas lined by flattened epithelial cells or cuboidal cells resting on prominent fibroblastic stroma. There was no atypia, mitotic activity or stromal invasion (photograph 4, 5) & solid area was composed of sheets and fascicles of bland spindle cells admixed with collagen (photograph 3) .The tumour was diagnosed as serous cystadenofibroma. Both fallopian tubes were unremarkable. Uterus showed proliferative endometrium and chronic cervicitis.Left ovary was unremarkable.

Discussion :

Ovarian cystadenofibroma is a relatively rare benign tumor that is seen in women aged 15-65 years. [4]

Benign tumors of ovary are classified into

- epithelial origin tumors- serous cyst adenoma and mucinous cystadenoma
- germ cell tumors-dysgerminoma, teratoma, choriocarcinoma
- sex cord stromal tumors- fibroma, thecoma, adenofibroma, sertoli-leydig cell tumor

Surface epithelial tumours are the commonest of ovarian tumours. Sex cord stromal tumours are less common. Combinations of these tumours are very rarely encountered [5]. Serous tumour can have a fibrous component in the subtype called serous cystadenofibroma. It is a benign tumour in which glands and cysts are scattered together in a fibroblastic stroma. They account for 1.7% of all benign ovarian tumours and occur in women between aged 40-50 years. Clinically as well as on imaging, because of the presence of solid and cystic components, the tumour may be mistaken as malignancy and a radical surgery may be done. Even perioperatively, a cystadenofibroma may resemble a malignant tumour [6].This case signifies the importance of microscopy in neoplasms that masquerade as malignant on imaging, perioperatively and grossly. Awareness of this combination in ovarian tumors among gynecologists and pathologists may help in avoiding such mismanagements. Both components being benign, excision is curative [7]. Extensive search of the English literature showed only one such case report by Copland and Coleman titled Bilateral concomitant fibroma and serous cystadenoma of ovary in a 70-year-old female in an article published in 1946 [8].

Acknowledgement :

We are thankful to Dr. S.M. Patel, HOD Pathology and Dr. Atul Munshi, HOD, Obs & Gyn Department, GCS Medical College, Ahmedabad for their diagnostic guidance and support to prepare a case report.

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Anesthetic management of a patient with Wolff-Parkinson-White syndrome for Modified Radical Mastectomy A case r eport

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Abstract :

Wolff Parkinson White syndrome (WPW) is an uncommon cardiac disorder having an aberrant pathway between atria and ventricles. It may pose problem for anesthesiologist during general anesthesia due to sudden development of tachyarrhythmia which may result in deleterious hemodynamic changes. We are reporting a known case of WPW syndrome for modified radical mastectomy under general anesthesia. Management of the present case is an important pearl to revisit management of WPW syndrome. The perioperative management should be tailored according to the nature of surgery and the clinical presentation of the patient.

Key Words : Wolff Parkinson White syndrome, cardiac arrhythmia, Anesthesia

Introduction :

Wolff Parkinson White (WPW) syndrome is a pre-excitation syndrome caused due to an aberrant pathway between atria and ventricles, bypassing the normal atrioventricular (AV) conduction.[1,2] Incidence of pre excitation syndrome varies from 0.1-3per 1000 in healthy subjects[3]. The AV node utilizes a calcium-dependent slow inward current, while the accessory pathway utilizes a sodium-dependent fast inward current for electrical impulse transmission. The lack of physiological delay in transmission of the sinus impulse via the abnormal path results in short PR interval, and ventricular excitation being a composite of the two impulses results in a fusion beat seen as a delta wave and prolonged QRS complex. Patients may present with symptoms ranging from mild chest discomfort, palpitation and hypotension to severe cardiopulmonary compromise in malignant variety of WPW syndrome. Anesthetic management of such patient, if diagnosed preoperatively is not difficult, but sudden intra operative appearance of short PR interval and delta wave can be troublesome as these patients are known to have life threatening tachyarrhythmia like paroxysmal supra-ventricular tachycardia (PSVT), atrial fibrillation (AF) etc. Anesthetic drugs change the physiological pathway so complications may be precipitated, thus it is important to know about WPW syndrome and its management.[4] After getting permission from institution ethical committee we are presenting a case of ca breast with WPW syndrome, posted for elective modified radical mastectomy.

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Case report :

A 56 year old, 50 kg ASA II female patient of right ca breast was posted for modified radical mastectomy under general anesthesia. She was a known case of WPW syndrome, but asymptomatic at the time of surgery. There was no history of palpitation, syncope, dizziness, and chest pain up to the time of surgery and she was not a known case of hypertension, diabetes and ischemic heart dieses. Consultation of cardiologist was done. As the patient was asymptomatic, no treatment started before operation.

On pre anesthetic examination, her pulse rate was 100/ per minute and blood pressure was 120/84 and preoperative SPO_2 was 100%. On auscultation chest was clear. Electrocardiograph (ECG) showed decreased PR interval, delta waves (slurred upstroke of QRS), wide QRS and associated ST and T wave changes (Fig 1). The 2D-echocardiography (ECHO) showed normal valve and ventricular function with 60% ejection fraction. Laboratory tests including complete haemogram, liver function test, renal function test, serum electrolytes and coagulation profile were normal.

The patient was counseled and informed consent was obtained. On the night before surgery, tab Lorazepam 2mg and early in the morning. tab diazepam 5mg was given.

In the operation room after taking an intravenous access, routine monitoring in the form of ECG, NIBP and SPO_2 were applied. The anti arrhythmic drugs like Adenosine, Amiodarone, Esmolol, Lignocaine, Inotrops and defibrillator were kept ready. The patient was induced with Inj. Fentanyl 100mcg followed by a induction dose of Inj

Thiopentone sodium 350mg. Inj Veuronium bromide 5 mg given to facilitate endotracheal intubation. Patient was ventilated with 100% oxygen for 3 mins. Patient was intubated with ETT No 7. After intubation heart rate increased to 130/mins. Blood pressure was 128/80 and SPO2 was 100%. Inj Esmolol 10mg iv given and repeated again after 5mins. Patient's heart rate returns normal to 70beats/min with normal blood pressure.

Anesthesia was maintained with O_2+N_2O+Sevoflurane and with Inj Veuronium bromide 1mg sos. Patient was reversed with Inj Neostigmin 3mg, Inj. Glycopyrollate 0.4 mg. To reduce stress response patient was extubated in deeper plane of anesthesia. Immediately after surgery she was transferred to ICU. She received analgesia in the form of Diclofenac sodium AQ 75mg i.v. 8 hourly. The subsequent course in hospital was uneventful and she was discharged on 7th postoperative day.

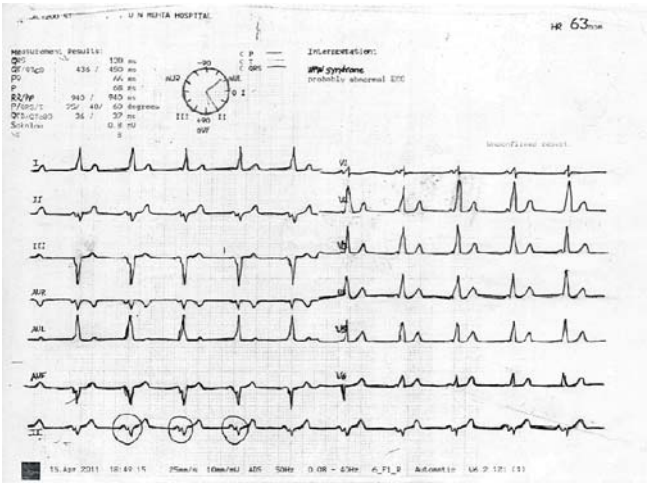

Figure 1 : ECG depicting wide QRS complex due to "Delta waves" seen in WPW syndrome

Discussion :

WPW syndrome may have a genetic component and inherited as a familiar trait, with or without associated congenital heart diseases(CHD).[5] Patient with WPW syndrome have an accessory AV pathway and bypasses the natural AV nodal pathway, this may lead to reentrant tachyarrhythmia and sudden cardiac arrest[6]. Some associated factors that perpetuate the dysarrythemia are Coronary heart disease, Ischemia, Cardio myopathy, Pericarditis, Electrolyte imbalance, Thyroid disease and Anemia.

The aim of the anesthetic management should be the avoidance of sympathetic stimulation such as pain, anxiety, stress response to intubation and Hypovolemia.

We have used Inj Fentanyl before induction to alleviate anxiety. Patient was induced with Inj. thiopental sodium and Inj. vecuronium bromide because Vecuronium is a cardio stable so preferred to other muscle relaxant. Inj propofol can be used as the delta wave of Wolff-Parkinson-White syndrome has been shown to disappear and the P-R interval to normalize but the delta wave returnes immediately after propofol discontinuation[7]. Inj. Fentanyl and Inj. xylocard used to reduce the stress response to intubation. Sevoflurane have no effect on AV node so preferred as inhalation anesthetic agent. Newer relaxants Cis-atracurium and Mivacurium can be safe because no reversal agent required for them[4,8] but it is not available here. Neostigmine may enhance accessory pathway during AF associated with WPW syndrome.[9] Drugs like atropine, ketamine, pancuronium, halothane precipitate tachycardia, therefore should be avoided. We can use thoracic epidural analgesia for post operative pain relief.

Treatment of WPW syndrome is consist of either radio frequency ablation of the accessory pathway or anti-arrhythmic drugs slowing AV conduction or AV nodal blocking medication to slow AV nodal conduction. Magnesium has been used for treatment of paroxysmal atrioventricular tachycardia in WPW syndrome.

During the perioperative period if some arrhythmias like an acute episode of reciprocal narrow QRS tachycardia occurs, than vagal maneuvers are tried initially, if not successful then adenosine followed by intravenous Verapamil or Diltiazem are the other alternative.[3]

An external cardioverter defibrillation is done in case of unstable tachycardia. If AF is suspected, drugs that prolong refractoriness in accessory pathways (Procainamide, Propranolol) must be used and avoid Verapamil and Digoxin. Electrical cardio version should be done in case of hemodynamic compromise or ventricular fibrillation.[10] Refractory arrhythmias have been managed with Phenylephrine by acting directly to stimulate the arterial baroreceptors and hence vagal tone.[9]

We conclude that patient with WPW syndrome can be managed successfully under general anesthesia but care should be taken to reduce stress response during intubation and extubation and avoiding any sympathomimetic drugs that causes tachycardia. Antiarrythmic drugs and defibrillator must be kept ready. Perioperatively, even asymptomatic patient can develop arrhythmias, therefore meticulous monitoring is essential.

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Ectopic Kidney : A Case Report

Shital T. Shah, Kiran V. Arora**

Abstract :

An ectopic kidney is a rare congenital anomaly that occurs when the kidney fails to ascend to its normal position . Abnormalities of kidney and/or urinary tract are more common in male than female. A pelvic kidney is a rare entity with a low incidence. An ectopic kidney is often associated with an increase incidence of stone formation as a result of stasis caused by altered geometry of the urinary drainage. A case of ectopic left kidney was identified during routine dissection of 60 years old female cadaver in Anatomy Department of one of the Medical Colleges in Ahmedabad, (Gujarat).

Key Words : Ectopic kidney, Ureter, Inferior venacava, Renal pelvis.

Introduction :

The kidneys are bean shaped organs located behind the peritoneum in the middle of the back. Kidneys filter the waste and extra fluid from the blood. The wastes and extra fluid become urine, which drains from the kidney to the bladder through the tubes called ureter. Urine is stored in a bladder until it is released from the body during urination. [1]

Variations in the urogenital system are common. Anomalies may occur in number, position, shape, size and location of kidneys and also in size and number of ureters.

Kidneys normally start to develop in the pelvis and migrate to their normal anatomical position in upper abdomen. The ascend of the kidneys precedes the descent of the gonads into the pelvis. Caudal growth in the embryo appears to assist in migration of the kidneys out of the pelvis in to their eventual location in the renal fossa. They attain their adult position by the 9th gestational week.

Factors which interfere with development such as teratogenes, genetic factors, the ureteric bud not meeting with the nephrogenic blastema for normal nephrogenesis or metanephric maternal disease, may result in abnormal migration of kidney resulting in renal ectopia.[2]

Case report: The routine dissection of a cadaver at the Department of Anatomy, one of the medical colleges in Ahmedabad, (Gujarat), it was found the left kidney lying in the pelvic cavity where as the right kidney was oval in shape and normal in position.

The left kidney had two renal arteries and two renal veins.

Renal artery: One artery entered the kidney through the hilum from the anterior aspect and other the artery entered the kidney from the posterior aspect of the upper pole. Artery which enter through anterior aspect arise from the right common iliac artery and which enter through posterior aspect of upper pole, arise from left common iliac artery.

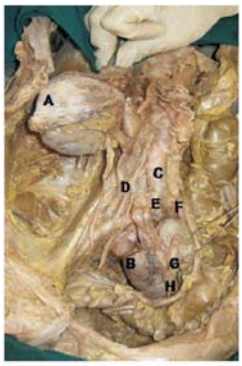

Fig.-1: Right kidney in normal position and left kidney in pelvis. A- Right kidney, B- left kidney, C Aorta, D- Inferior venacava, E Right common iliac, F Left common iliac, G- major calyx, H renal pelvis.

Renal vein: Out of two renal veins, one vein drained into the IVC and other small vein drained into the tributary of IVC.

We found three major calyces uniting to form renal pelvis on the anterior surface which continued as ureter downwards.

In coronal section, in direct examination the pyramids could not be differentiated. Major calyces were lying near to the anterior surface and fatty tissue was also seen.

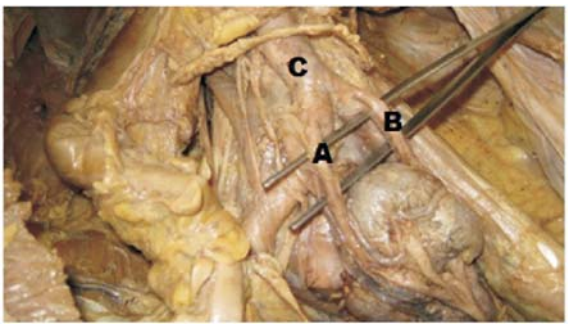

Fig.-2: Renal arteries: A, B- left Renal arteries, C- Aorta

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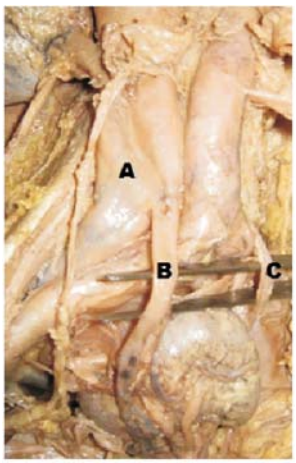

Fig. -3: Left Renal veins: A- Inferior venacava, B & C- Left Renal veins .

Discussion: Among the congenital anomalies of all the systems of the body, the occurrence of urinary tract system anomalies is 3% in which pelvic kidney is a rare anomaly with an occurrence of about 1 in 2500 live births in which left kidney is more commonly affected. [3,4]

Belsare S.M. et .al[5], and Vandana V.C. [6] Found a consequence to left kidney being ectopic, spleen did not show the renal impression. Ectopic kidneys take their blood supply from the vessels closest to them at the end of their limited ascent.

An ectopic kidney is classified into an abdominal, lumbar or pelvic kidney based on its location in the posterior abdominal cavity. It is rare in the thoracic cavity.

The factors that may prevent orderly movement of the kidney include lateral bud mal development, defective metanepharic tissue, genetic abnormalities, maternal illness, and teratogenic causes. [7]

Developmentally kidney first lies in pelvic cavity with its hilum directed anteriorly, which then gradually ascends with medial rotation of hilum and reaches to the abdomen and away from the midline. Since under ascent is more common than the over ascent, ectopic kidneys are more commonly found in the pelvis or lower abdomen. [8]

Pelvic ectopia is seen in an estimated 1 of 2100 to 3000 autopsies.Most ectopic kidneys are clinically asympatomatic and they are not susceptible to disease than normal positioned kidneys, except for the development of hydronephrosis and urinary calculus formation.[9] An ectopic kidney is often associated with an increase incidence of stone formation as a result of stasis caused by altered geometry of the urinary drainage .

According to published report main characteristics of the congenital anomaly of an ectopic kidney are as follows.[10]

1. Blood vessels are derived from the distal aorta and iliac artery, with venous anatomy also varying.
2. The kidney is usually smaller, flattened and incompletely rotated.
3. The kidney often has a short ureter.

Living with ectopic kidney may not cause any symptoms and may function normally, even though it is not in its usual position. Many people have an ectopic kidney and do not discover it until they have tests done for other reasons. In other case, an ectopic kidney may cause abdominal pain or urinary problems. When a kidney is out of the normal position, drainage problems are likely. Sometimes, urine can even flow backwards from the bladder to the kidney, a problem called vesicoureteral reflux, or simply reflux. Abnormal urine flow can set the stage for a number of problems.[11]

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A Rare Case of Kimura's Disease

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Abstract :

Kimura disease is a rare form of chronic inflammatory disorder with uncertain aetiology involving subcutaneous tissue, predominantly in the head and neck region and frequently associated with regional lymphadenopathy and/or salivary gland involvement. This makes it a condition of interest to clinicians who frequently see head and neck pathology. Though relatively uncommon, there are increasing numbers of reports of the condition and it should be considered as part of the standard differential diagnosis. Kimura disease has been described more often in Asians, but it does occur in non-Asians with a similar clinicopathologic presentation.

Key Words : Kimura's disease, Eosinophilia, Lymphadenopathy

Introduction :

Kimura's disease is an unusual condition first reported by Chinese authors Kimm and Szeto[1] in 1937and, besides its eponym, has been variously known as epithelioid haemangioma, atypical pyogenic granuloma and cutaneous eosinophilic lymphofolliculosis. The definitive description was published by Kimura et al [2] in Japan in 1948 and since that time, there have been a slowly increasing number of reports. The disease is most prevalent in Asians, uncommon in Caucasians and rare in Blacks. It has been suggested that the common factor is a degree of Asian ancestry.[1] Kimura's disease is a rare chronic inflammatory condition of unknown etiology [3] which presents with a characteristic triad of signs and symptoms, namely a painless, slowly enlarging soft tissue mass (or masses), associated lymphadenopathy and peripheral eosinophilia.

Clinically, the subcutaneous soft tissue masses occur predominantly in the head and neck region and often involve the parotid glands. Approximately 67 to 100% of patients develop regional lymphadenopathy and, in longstanding disease, this may become generalized. [0] Patients may complain of local or generalized pruritus and subacute or chronic dermatitis. There may be proteinuria and laboratory investigations will invariably reveal peripheral eosinophilia and increased serum immunoglobulin IgE.

While there has been considerable discussion in the pathology literature concerning this disease, it is still unknown by most surgeons. This report seeks to increase awareness of an interesting condition.

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Case report :

A 31-year-old male presented with a complaint of a slowly enlarging mass in the left parotid region. History revealed that he was having this swelling since 8 months and was treated with antibiotics without much benefit. On examination palpable lymph nodes were found in left parotid and postauricular region. Fine needle aspiration cytology revealed inflammatory cells and differential count revealed marked eosinophilia(30%). MRI suggested mass lesion in left cheek region involving superficial lobe of parotid gland with lymphadenopathy. As patient was not having any local infection clinically diagnosis was not reached. Hence trucut biopsy was performed which revealed a dense inflammatory infiltrate and mild fibrosis. Excision biopsy was carried out and diagnosis of kimura's disease was made based on histopathology.

Biopsy revealed fibrosis and dense inflammatory infiltrate characterized by lymphoid tissues with germinal centres and numerous eosinophils with eosinophilic abscess formation (Figure 1 :10x view showing multiple eosinophils amongst parotid tissue, Figure 2 : 45x view showing Eosinophils) . There was no evidence of atypia.

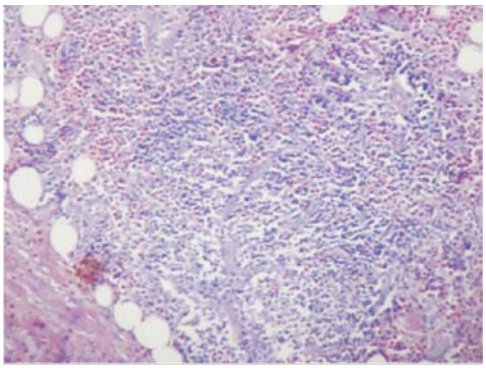
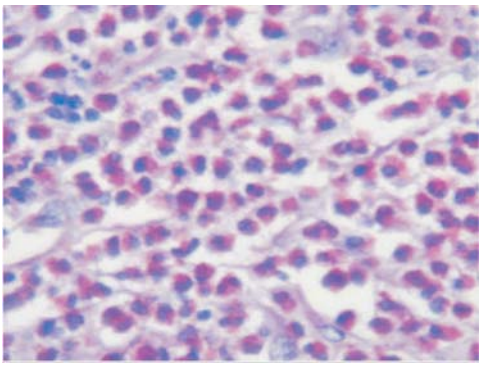


Figure 1 : 10x view showing multiple eosinophils forming microabscess amongst parotid tissue



Figuere 2 : 45x view of previous slide showing multiple eosinophils

Discussion :

Clinically, malignant lymphoma, parotid tumours, haemangioma, pyogenic granuloma, Mikulicz's disease and Kikuchi's disease are all conditions for which Kimura's disease has been mistaken in the past. [4] Other conditions to consider include Kaposi's, sarcoma, angiosarcoma, eosinophilic lymphoma and angioimmunoblastic lymphadenopathy; and parasitic diseases such as tissue-invasive helminth infections, cysticercosis, sparganosis, toxocariasis and several forms of invasive miasis. [1] It should be considered in the differential diagnosis of any lymph node demonstrating an eosinophilic infiltrate and prominent follicular hyperplasia. It is a distinctive clinicopathologic entity with characteristic histologic features and is important to separate from drug reactions, hypersensitivity, and infectious agents.

In Kimura's disease there is classically a dense inflammatory infiltrate characterized by eosinophilic lymphoid tissue with germinal centres and microabscesses. There is often marked fibrosis found within the typical lesions. Pathologically, the picture is perhaps most difficult to distinguish from angiolymphoid hyperplasia with eosinophilia (ALHE), and for a long time these two conditions were thought to represent one and the same pathology, but the current consensus is that they represent two ends of a spectrum of similar diseases. [5]

Clinically, Kimura's disease is believed to be a disease of the Far East and Asia, and ALHE one of the western world. Jambhekar et al [5] suggest that ALHE is known to occur in older, predominantly female populations, while Kimura's disease is primarily a disease of younger males.

The cause of Kimura's disease remains enigmatic and the low incidence of the condition makes clinical research in this regard difficult. There are, however, several theories of aetiology.

The eosinophilia and elevated IgE levels seem to favour a parasitic cause, but this has never been established. Somewhat more appealing is the suggestion that this entity may represent a form of unusual atopic response. Evidence for this stems from the observation that the histologic features vary with site and duration of the lesion, [6] as well as the local tissue eosinophilia, mast cell hyperplasia, polytypic lymphoplasmacytic infiltration with reactive germinal centres and a blood picture typified by eosinophilia and raised serum IgE levels. Our patient showed 30% eosinophilia in differential leucocyte count. The treatment of choice for localized disease is surgical excision, [1,4] although some surgeons favour conservative management, in the form of intralesional steroids[1] or radiation therapy [7] particularly in anatomically sensitive areas such as the periorbital region.[8] There have also been reports of recurrence in 15 to 40% of cases,[8] even after apparently adequate surgical excision and excisional biopsies,[4] but this may be because of the poor delineation of the borders of Kimura's lesions, suggesting that adjunctive frozen sections may be useful, especially in re-excision of recurrences.

In summary, Kimura's disease is an indolent, benign, but locally disfiguring disease, whose true importance lies in its ability to mimic a number of other benign inflammatory and neoplastic conditions of the head and neck. Knowledge of the condition, its clinical appearance, course and histopathology puts the surgeon in a better position to diagnose patients and provide optimal treatment.

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