

# International Journal of Medical Science and Education

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- Abstract
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- Introduction
- Materials and Methods
- Ethics
- Statistics
- Results
- Discussion
- Conclusion
- Acknowledgements (If any)
- References
- Figure legends
- Tables
- Appendices (if necessary)
- Abbreviations (if necessary)

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This section should end with new answers/questions that arise as a result of your work.

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- Tables should be self-explanatory and should not duplicate textual material.
- Tables with more than 12 columns and 25 rows are not acceptable.
- Number tables, in Arabic numerals, consecutively in the order of their first

**Table 1: PK parameters as calculated for enalapril in different groups**

Parameter value	Group Ib	Group IIb	Group IIIb	Literature
<i>C<sub>max</sub></i> (ng/ml)	91±8.55*	96.60±9.29	95.00±7.32	69±37
<i>t<sub>max</sub></i> (hrs)	4.34±0.50	3.70±0.4	3.85±0.23	NA†

\*: Normalized to therapeutic dose of 10mg; †: Data not available

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Nozari Y, Hashemlu A, Hatmi ZN, Sheikhvatan M, Iravani A, Bazdar A, et al. Outcome of coronary artery bypass grafting in patients without major risk factors and patients with at least one major risk factor for coronary artery disease. Indian J Med Sci 2007; 61: 547-54

Volume with supplement: Shen HM, Zhang QF. Risk assessment of nickel carcinogenicity and occupational lung cancer. Environ Health Perspect 1994; 102 Suppl 1:275-82.

Issue with supplement: Payne DK, Sullivan MD, Massie MJ. Women's psychological reactions to breast cancer. Semin Oncol 1996; 23(1, Suppl 2):89-97.

### Books and Other Monographs

Personal author(s): Ringsven MK, Bond D. Gerontology and leadership skills for nurses. 2nd ed. Albany (NY): Delmar Publishers; 1996.

Editor(s), compiler(s) as author: Norman IJ, Redfern SJ, editors. Mental health care for

elderly people. New York: Churchill Livingstone; 1996.

Chapter in a book: Phillips SJ, Whisnant JP. Hypertension and stroke. In: Laragh JH, Brenner BM, editors. Hypertension: pathophysiology, diagnosis, and management. 2nd ed. New York: Raven Press; 1995. pp. 465-78.

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Journal article on the Internet

Abood S. Quality improvement initiative in nursing homes: the ANA acts in an advisory role. Am J Nurs [serial on the Internet]. 2002 Jun [cited 2002 Aug 12]; 102(6): [about 3p.]. Available from: <http://www.nursingworld.org/AJN/2002/june/Wa watch.htm>

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Foley KM, Gelband H, editors. Improving palliative care for cancer [monograph on the Internet]. Washington: National Academy Press; 2001 [cited 2002 Jul 9]. Available from: <http://www.nap.edu/books/0309074029/html/>.

Homepage/Web site

Cancer-Pain.org [homepage on the Internet]. New York: Association of Cancer Online Resources, Inc.; c2000-01 [updated 2002 May 16; cited 2002 Jul 9]. Available from: <http://www.cancer-pain.org/>.

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American Medical Association [homepage on the Internet]. Chicago: The Association; c1995-2002 [updated 2001 Aug 23; cited 2002 Aug 12]. AMA Office of Group Practice Liaison; [about 2 screens]. Available from: <http://www.ama-assn.org/ama/pub/category/1736.html>

Dissertation

Susan MK. Hospital acquired infections: Role of antibiotic resistance [dissertation]. St. Louis (MO): Washington Univ.; 2002.

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## PREVALENCE PATTERN OF MORBIDITY AND MORTALITY IN VENTILATION ASSOCIATED PNEUMONIA (VAP) PATIENTS OF INTENSIVE CARE UNIT (ICU) IN MAHARASHTRA REGION.

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### Abstract

**Objective:** To study the prevalence of morbidity & mortality in ventilation associated pneumonia (VAP) patients of intensive care unit (ICU). **Material and Methods:** The present study was conducted on 265 admitted patients of ICU during the period of July 2004 to June 2005 in Government Medical College & Hospital. A total of 100 patients on mechanical ventilation were followed-up prospectively. The microbiological test results were reported to the clinician immediately for appropriate antibiotic administration helping the betterment of the patient. Patients were followed-up twice a week on day 4 and day 7. The end-point was betterment with removal of patient from ventilation or death of the patient.

**Results:** Out of the total 100 patients studied, 97 were colonized either with monomicrobial or polymicrobial pathogens. Out of these 97 colonized patients, 57 developed ventilation-associated pneumonia (VAP) with incidence of 58.76% among colonized patients. The overall mortality was 57% of the total studied patients. The mortality in patients colonizing trachea and developing VAP was 54.39%, whereas, the mortality in those only colonizing, but not developing VAP was 41.86%. Maximum 77.4% deaths were in the poisoning cases. Colonization rate among OPP cases was 97.44%, VAP rate was 64.10% and death rate was 43.59%. **Conclusion:** Knowledge about the colonization in mechanically ventilated patients, developing into VAP and their antimicrobial susceptibility pattern at the institute level by prospective study will definitely be useful in formulating its antibiotic policy and the optimal management of the patients by decreasing the incidence of morbidity and mortality amongst VAP.

**Keywords:** Ventilation-associated pneumonia, morbidity and mortality, colonization.

### INTRODUCTION:

Hospital-acquired pneumonia is the most common nosocomial infection reported among mechanically ventilated patients admitted in the ICU, where it is labeled as 'Ventilation-associated pneumonia' (VAP), with highest mortality & morbidity in spite of the availability

of potent broad-spectrum antimicrobial agents, multifaceted supportive care modalities, and the use of preventive measures.(1,2) The mortality rate in VAP ranges from 24% to 80% in several studies(3,4) with 2 to 10 fold higher risk of death in ICU-ventilated patients.(5) The primary risk

factor for development of VAP is mechanical ventilation with its requisite endo-tracheal intubation.(6) To label the presence of organisms in the trachea as 'colonization' or 'pneumonia' is not a very simple task.(7,8) VAP is usually seen in patients who are mechanically ventilated for more than 48 hrs. with one of the following features according to Johanson *et al.*( 6,9,10) (New or progressive pulmonary infiltrate on X-ray chest, Fever > 38 ° C, Polymorphonuclear Leukocytosis > 10,000 / cu.mm., Purulent tracheobronchial secretions).

The high mortality associated with VAP in the medical ICU has led to strategies, which encourage rapid institution of broad-spectrum antibiotics.(11) The literature supports the view that inadequate antibiotics for 48-72 hrs. is associated with an increased mortality.(11) Several studies have shown that proper antimicrobial treatment of patients with VAP get better the outcome. (9,12) The selection of empiric antibiotic therapy should be based on whether the patient has received prior antimicrobial therapy and on the duration of mechanical ventilation.(13) So the present study was conducted for effectiveness of antimicrobial therapy by seeing the prevalence of morbidity & mortality pattern of VAP amongst intensive care unit patients.

## MATERIALS & METHODS:

The present study was conducted in 5-bedded Intensive Care Unit (ICU), Government Medical College & Hospital, Aurangabad (Maharashtra). A total of 265 patients were admitted in the ICU during the study period from July 2004 to June 2005.

### Case Selection

Patients with more than 48 hours of mechanical ventilation (MV) with endotracheal tube were included in the study.(7) Patients on mechanical ventilation for 48 hours or less or who developed pneumonia within 48 hours of MV were excluded from the study. In addition, patients with fulminant pneumonia and pulmonary edema were excluded from the study. All the patients were given antibiotic prophylaxis with administration of gentamicin.

A total of 100 patients on mechanical ventilation with intubation tube fulfilling the inclusion criteria were followed-up prospectively. Exclusion criteria were severe immunosuppression (organ transplantation, AIDS) and evidence of pulmonary infection or suspicion of gross aspiration at admission.(14) Informed consent was obtained from the patient or the nearest relative of the patient. According to Johanson *et al* criteria, the episodes of ventilation-associated pneumonia were diagnosed. (9) The end-point was betterment with removal of patient from ventilation or death of the patient.

### Data collection

The details of Patients fulfilling the inclusion criteria were recorded in the specially designed proforma which includes patient's name, age, sex, registration number and detail history was taken. Major complaints, underlying disease, indication for intubation, general & systemic examination, and results of routine investigations with X-ray chest reporting were noted. Patients receiving antibiotics with its duration of administration was also recorded.

Patients were followed-up twice a week on day 4 and day 7. During the follow-up visits, special note about the duration of MV, CBC, X-ray chest, rise in temperature and extra pulmonary focus, if any was noted.

### Collection and transport of Endotracheal aspirate (EA)

On the day of intubation of the patient, the tracheal swab was taken for the presence of bacterial colonization. The endotracheal aspirate of the patient was taken within the first 24 hours of intubation using a sterile mucus extractor (trap) under all aseptic precautions. On subsequent visits on day four and seven as well, the endotracheal aspirates were collected similarly and then transported immediately to laboratory in the Department of Microbiology. The results were reported to the clinician immediately for appropriate antibiotic administration helping the betterment of the patient.

### RESULTS:

During the one-year study period, from July 2004 to June 2005, a total of 265 patients were admitted in the medical ICU. Out of which 100 patients mechanically ventilated (MV) with intubation tube for more than 48 hours were included in the study to evaluate the morbidity and mortality pattern of VAP. The study group comprised of 64 males and 36 female patients.

Out of the total 100 patients studied, 97 were colonized either with monomicrobial or polymicrobial pathogens. Out of these 97 colonized patients, 57 developed ventilation-associated pneumonia (VAP) with incidence of 58.76% among colonized patients. In all, 3 patients were not colonized by the

microorganisms, either on day 1 or day 5 of intubation and showed signs of recovery. Thus, these 3 patients were extubated and discharged on day 6 with complete recovery from the symptoms they presented with, at the time of admission.

The incidence of VAP in the present study was seen in 57 patients (57%) out of 100 patients studied. Most of the patients, 31 (54.4%) of the total 57 patients were in the age-group 21-40 years. Mean age of patients with VAP was 31.7 years. Total four patients were at extremes of age. The numbers of males affected were almost twice 64.9% compared to females 35.1%. (Table-1)

**Table 1 : Age and Sex Wise Distribution of VAP**

AGE (years)	MALE	FEMALE	TOTAL
0-10	0	1	1
11-20	5	2	7
21-30	12	7	19
31-40	7	5	12
41-50	3	2	5
51-60	7	0	7
61-70	1	2	3
71-80	2	1	3
<b>TOTAL</b>	<b>37</b>	<b>20</b>	<b>57</b>

Out of 57 developing VAP, 44 patients developed on day 7 of mechanical ventilation in the ICU. Only 13 patients developed VAP on day 4 of MV. Considering the cut-off day as fourth day after mechanical ventilation (MV) for defining early and late-onset VAP, 13 (22.8%)

patients developed early-onset and 44 (77.2%) patients developed late-onset VAP.

Of the total episodes of ventilator-associated pneumonia, 48 (84.2%) showed polymicrobial (two or more than two organisms) growth. Only 9 patients (15.8%) developed VAP due to the monomicrobial organism. Of the 48 patients who developed VAP due to polymicrobial organisms, 9 (18.6%) patients developed on day 4, while with increase in duration of MV to day 7, 39 (81.4%) more new patients developed VAP.

The most common category was poisoning (66%), mainly organophosphorus (OPP) accounting 39% and the strychnine poisoning 27% of the cases. The numbers of neural cases with Guillain-Barre Syndrome (GBS) were 14, while 10 patients presented each with chronic obstructive pulmonary disease (COPD), 6 with acute renal failure (ARF) and, 4 with acute respiratory distress syndrome (ARDS). (Table-2) Thus, almost all the cases included were of non-infective etiologies. Almost all of the patients had received prophylactic antibiotics after intubation, which consisted mainly of Inj. Ampicillin and Inj. Cefotaxime.

Maximum 77.4% deaths were in the poisoning cases. Thirty-nine patients in the study group were of OPP. Out of the 25 of these developing VAP, 17 patients died. 1 patient did not colonize with any of the organisms and was discharged on day 5 with complete recovery. Thus, colonization rate among OPP cases was 97.44%, VAP rate was 64.10% and death rate was 43.59%. 7 patients died without developing VAP in out of total 14 patients of OPP who did not developed VAP. The reasons for death in these patients varied from cardiac arrest to respiratory failure. Out of the remaining 7 patients, 1 was

discharge on day 5 after recovery, 2 were discharged against medical advice after about a week after admission and 4 recovered after appropriate antimicrobials.

Twenty-seven patients in the study group were of strychnine poisoning. Out of the 14 of these developing VAP, 7 patients died. Thus, colonization rate among strychnine poisoning cases was 100%, VAP rate was 51.85% and death rate was 25.93%. 5 died due to respiratory failure and cardiac arrest in out of the 13 patients of Strychnine poisoning who did not developing VAP. Total 8 patients recovered after adequate management with broad-spectrum antibiotics, nutritional supplement and supportive care.

Of the total 14 patients of GBS studied, 7 developed VAP. Of these, 3 patients died of VAP due to polymicrobial. 1 patient did not colonize with any organisms and was discharged on day 5 with complete recovery. Thus, colonization rate among cases of GBS was 100%, VAP rate was 50% and death rate was 21.43%. Of the 7 patients of GBS not developing VAP, 1 patient was discharged on day 5 after recovery, 2 patients died of cardiac arrest and remaining 4 patients recovered well without any residual complications.

Ten patients in the study group were of chronic obstructive pulmonary disease (COPD). Out of the 6 of these developing VAP, 2 patients died. Thus, colonization rate among COPD cases was 100%, VAP rate was 60% and death rate was 20%. Of the 4 patients of COPD not developing VAP, 2 died due to respiratory arrest, while the other two recovered and were discharged.

Of the total 6 patients of ARF studied, 3 developed VAP. Of these, 1 patient died on day 7 with late-onset VAP due to polymicrobial. 1

patient did not colonize with any organisms and was discharged on day 5 with complete recovery. Thus, colonization rate among cases of ARF was 83.33%, VAP rate was 50% and death rate was 16.67%. Of the 3 non-VAP patients of ARF, 1

died due to respiratory failure and 1 patient was shifted to the dialysis unit for further management. 1 patient was extubated and discharged on day 5 after recovery.

**Table 2 : Death Comparison between VAP and NON-VAP Patients.**

Disease	Patients developing VAP	Death in VAP patients	NON-VAP patients	Death in NON-VAP patients	Total Deaths
OPP (39)	25	17	14	07	24
Strychnine poisoning (27)	14	07	13	05	12
GBS (14)	07	03	07	02	05
COPD (10)	06	02	04	02	04
ARF (06)	03	01	03	01	02
ARDS (04)	02	01	02	01	02
<b>TOTAL (100)</b>	<b>57</b>	<b>31</b>	<b>43</b>	<b>18</b>	<b>49</b>

Total 4 patients in the study group were of acute respiratory distress syndrome (ARDS). Out of the 2 of these developing VAP, 1 patient died on day 4 with early-onset VAP due to monomicrobial. Thus, colonization rate among ARDS cases was 100%, VAP rate was 50% and death rate was 25%. Of the 2 non-VAP patients of ARDS, 1 died due acute respiratory failure and 1 patient recovered and was discharged. (Table-2)

## DISCUSSION:

Ventilation-associated pneumonia (VAP) is the commonest complication in patients mechanically ventilated with endotracheal intubation tube. A wide range of microorganisms causes the potential problem of VAP. (2,4,14,15,16)

In the present study, colonization occurred in 97 patients out of the total 100 patients studied. Hence, total colonization rate was found to be 97%.

Various studies have reported differential colonization rates of trachea by varying pathogenic microorganisms, most commonly by the Gram-negative bacteria. (7,8,14) Delclaux *et al* in a study showed 66%, Johanson *et al* found 84.6% and Albert *et al* reported 85% overall colonization rate in their study group.(17,9,7)

## Incidence of VAP

The incidence of VAP as reported by various workers varied from 9 to 78 %, depending on the severity of illness, type of patients studied, prophylactic antibiotic administration, the techniques & criteria used to diagnose the pneumonia.(3,7,18,19) This is due to diverse study design, various methods of specimen

collection and different diagnostic methodologies.

In present study incidence of VAP was 57%. Salata et al have shown 41% , Kollef et al 9.3%, Craven et al 21%, and Akca et al 31%.**(8,15,20,21)** In the present study, total 57% patients developed ventilator-associated pneumonia (VAP).The increased incidence of VAP in the present study might be due to longer period of MV averaging 13 days. It is a known fact that as the duration of ventilation increases, the chances of developing pneumonia also increases.

### Age and Sex Distribution

Fagon *et al* in their study on surgical and medical ICU patients, using PSB for diagnosis found that majority of patients were of older age group ( $65 \pm 10.5$  years). **(4)** Similarly, George *et al* in their study on mechanical ventilation (MV) patients in medical ICU using PSB and BAL for diagnosis reported a mean age of 57 years ( $\pm 2.7$  years) for VAP patients.**(2)** In both the above mentioned studies the underlying conditions that necessitated ventilation included chronic obstructive pulmonary disease, congestive cardiac failure, renal failure and shock. Conditions such as poisoning, CNS diseases like GBS and neuromuscular diseases accounted for only a minority of VAP cases.

In contrast, the present study of patients developing VAP included only 10.5% patients with an underlying diagnosis of COPD, 5.3% with ARF and 3.5% patients with ARDS. Involvement of CNS with most cases of poisoning comprised 80.7% of patients developing VAP. In a study conducted by Latorre *et al* the mean age of the patients was 17

years.**(3)** On the other hand, Craven *et al* found the mean age of 55 years in their study group.**(20)** In the present study, the mean age of patients developing VAP was observed to be - 31.7 years. Most of the patients in the present study were clustered in the young age group of 21-40 years, comprising of 56.1% of the patients. This subset of population is generally considered to be healthy and with a lesser predisposition to illness as compared to the older age groups. In our study, only four patients were at the extremes of life developing VAP. There were three between the age group 71-80 years and one patient with age less than 1 year. These patients were more likely to be in an immunocompromised state and therefore more prone to infection. This might explain the younger age group of VAP patients in the present study. In the present study, males accounted for 64.9% of VAP cases. Chastre *et al* also reported higher 52.8% of male patients and George *et al* reported 87.18% incidence of the male patients developing VAP in their study group.**(16,2)** Akca *et al* also reported more males 166 (63.9%) as compared to females 94 (36.1%), in their study on VAP.**(21)**

### Early & late onset VAP

In the present study, the tracheal aspirates were followed up on days 1, 4 and 7 of intubation to evaluate the colonizing organisms causing VAP. In our study, considering day 4 for early and late-onset VAP, 22.8% patients developed early-onset VAP, while 77.2% patients developed late-onset VAP.

The result of our study relates well to the study carried out by Trouilliet *et al* who, in their study of 135 episodes of VAP found 25.2% of early-onset VAP and 74.8% episodes of late-onset

VAP.(18) Akca *et al* found 33.3% episodes of late-onset VAP and 66.6% of early-onset VAP in their study group.(21) No prophylactic antibiotic therapy was given to any of their patients. They stated that in patients receiving prophylactic antibiotics the incidence of early-onset VAP is lower. Prod'hom *et al* observed, early-onset pneumonia (within first 4 days) represented 45% of all pneumonia episodes.(22) Heyland *et al* in a multicenter study on 1,014 reported an incidence of 23.9% early-onset (< 7 days) and 23.6% late-onset (> 7 days) VAP. (23) The low incidence of VAP in these studies could be due to greater specificity of criteria for diagnosis, clinical criteria and quantitative culture of PSB.

#### Monomicrobial versus Polymicrobial VAP

Various workers have reported polymicrobial etiology of VAP, which might be due to the aspiration of the oropharyngeal contents into the respiratory tract.( 4,10,16 )

Fagon *et al* reported 40% of the cases of VAP to be of polymicrobial etiology.(4) De Latorre *et al* found a very high polymicrobial incidence of 83.3% among the patients with VAP.( 3) Chastre *et al* studied microbiology of VAP in patients with ARDS and without ARDS using QC of PSB and BAL, reported polymicrobial etiology in 55% of VAP cases in ARDS and 60% of VAP cases without ARDS.(16)

In the present study, the incidence of polymicrobial VAP was 84.2% versus only 15.8% VAP due to monomicrobial etiology.

#### Underlying diseases

Johanson *et al* found that of the patients who developed pneumonia, 24% had respiratory diseases, and 26% had drug overdose as the

underlying condition.(9) Delclaux *et al* reported a very high incidence 60% of VAP in patients suffering ARDS. (17) Altered sensorium can also play an important role in the development of VAP, as the chances of aspiration are more in such a state.(24) This may be the reason for the patients with poisoning developing VAP. This explains the high incidence 57% of VAP in the present study.

#### Mortality

Results of several studies from 1986 to 2001 have confirmed that observation despite variation of population studied overall mortality rates for patients with or without VAP were respectively, 71% versus 28%, 33% versus 19%, 55% versus 25%. (4,10,20)

Chastre *et al* reported a higher mortality for VAP cases 47% compared to 28% for non-VAP cases.(19) A study by Heyland *et al* <sup>23</sup> has reported a mortality rate of 23.7% in patients with VAP.(23) Fagon *et al* using clinical and microbiological criteria reported a mortality rate of 71% in patients of VAP.(4) Fagon *et al* <sup>4</sup> also reported that mortality in patients with ventilator-associated pneumonia was two-fold higher than non-VAP cases.(4) Torres *et al* has reported an overall mortality of 33 %, whereas, Rello *et al* observed a statistically significant increase in the mortality of patients, who received inappropriate initial antibiotic therapy, inspite of a change in the treatment after culture results.(10,25)

In our present study, the overall mortality was 57% of the total studied patients. The mortality in patients colonizing trachea and developing VAP was 54.39%, whereas, the mortality in those only colonizing, but not developing VAP was 41.86%. The high mortality rate in those not



developing VAP could be explained, mostly due to the underlying disease and cardiac and/or respiratory failure.

Kollef *et al* in their study found mortality among patients with VAP (43.8%) not significantly different from the mortality rate among patients without VAP (37.6%).(15) Kollef *et al* in their study found that patients with VAP had a significantly longer duration of MV ( $23.5 \pm 18.4$  days) compared to those without VAP ( $12.5 \pm 9.1$  days).(15)

### CONCLUSION:

Clinicians need to adapt the treatment recommendations and preventive measures to their respective institutes, as the routes of infection and agents causing pneumonia vary considerably among health-care facilities. (26)

Therefore, knowledge about the commonest etiological pathogens colonizing trachea in mechanically ventilated patients, developing into VAP and their antimicrobial susceptibility pattern at the institute level by prospective study will definitely be useful in formulating its antibiotic policy & the optimal management of the patients by decreasing the incidence of morbidity and mortality related to VAP.

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**Ethical approval:** The study was approved by the institutional ethics committee

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## DIAGNOSTIC YIELD OF FIBER-OPTIC BRONCHOSCOPY IN SPUTUM SMEAR NEGATIVE AND RADIOLOGICALLY SUSPECTED OLD CASES PULMONARY TUBERCULOSIS

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### Abstract

**Objectives:** - To study the diagnostic yield of fiber-optic bronchoscopy in sputum smear negative under RNTCP and radiologically suspected old cases of pulmonary tuberculosis. **Material and Methods:** - The present study was carried out on 57 patients who had come with previous history and three tuberculosis sputum smears for Acid Fast Bacilli was negative under RNTCP and chest X-ray suggestive of pulmonary tuberculosis at Department of Tuberculosis and Chest Diseases, RNT Medical College, Udaipur from 1<sup>st</sup> July, 2005 to 7<sup>th</sup> July, 2006 (one year). After assessment Fiber optic bronchoscopy was performed in every case per nasal or oral to observe the changes in tracheobronchial tree and to obtain specimens. Obtained specimens were subjected to AFB smear examinations, AFB culture, Cytology examinations. Reports were obtained and analyzed accordingly. **Results:** Diagnostic yield of fiber optic bronchoscopy for tuberculosis in patients who had history of ATT (n=57). Early positive yield for tuberculosis was 8.8% whereas overall positive diagnostic yield after culture results was 12.3%. Bronchial biopsy histopathology showed fibroid granuloma in one out of 6 patients (16.7%). **Conclusion:** - In conclusion, bronchoscopic procedures was found to be relatively safe and provided a better choice for the diagnostic of pulmonary tuberculosis in the sputum smear negative under RNTCP and radiologically suspected old cases of pulmonary tuberculosis.

**Key words:** Sputum smear-negative pulmonary tuberculosis (SSN-PTB), Radiologically suspected pulmonary tuberculosis, fiber- optic bronchoscopy.

### INTRODUCTION

Tuberculosis is caused by mycobacterium tubercle bacilli, primarily affecting the lungs. (1) India accounts for nearly one-third of global

burden of tuberculosis. There are about 5 lakh deaths occur annually due to tuberculosis with incidence and prevalence being 1.5 and 3.5 million per year respectively. (2) Diagnosis of

pulmonary tuberculosis is established by detecting mycobacterium in specimen by various methods, out of which microscopic examination of sputum smear for AFB is quickest, earliest, simple, cheap, and the most practicable and effective method for diagnosis of sputum smear positive pulmonary tuberculosis (3) but unfortunately AFB microscopy lack sensitivity as compared to culture.

Many medical conditions that may be misdiagnosed as smear negative tuberculosis includes bacterial pneumonia, empyema, pulmonary nocardiosis, PCP, fungal diseases, interstitial pneumonitis, gram negative bacteriemia, bronchogenic carcinoma, lymphoma, ABPA, CHF, COPD, occupational lung diseases (e.g., silicosis), residual lesion. (fibrosis, cavitations, etc.). (4)

Radiological diagnosis is the most sensitive tool in the diagnosis of pulmonary tuberculosis but it is not a specific test and some time it is difficult to diagnosis a defaulter or repeat case of TB with radiology.

Flexible fiber-optic bronchoscopy and related procedures like bronchial aspirate/washing, B.A.L., brushing and biopsy is a tool which may give access to the diseased area and better bacteriological and histological diagnosis. Its diagnosis yield is high enough to lead to a definitive diagnosis without any serious complications and delay. Most of the previous studies done are retrospective and only new sputum smear negative cases without history of previous ATT has been taken in these studies (5)

Hence, a prospective study was undertaken to evaluate the diagnostic yield of fiber-optic

bronchoscopy in sputum smear negative under RNTCP and radiologically suspected whose have take AAT previously cases of pulmonary tuberculosis irrespective to status of previous anti-TB treatment.

## MATERIAL AND METHODS

The present study was carried out on 57 patients, at Department of Tuberculosis and Chest Diseases, RNT Medical College, Udaipur from 1<sup>st</sup> July, 2005 to 7<sup>th</sup> July, 2006 (one year).

The patients who come with previous history and three tuberculosis sputum smear for Acid Fast Bacilli was negative under RNTCP and chest X-ray suggestive of pulmonary tuberculosis were included into the study. Severity of disease was classified according to radiological extent as under criteria of National Tuberculosis Association of USA (1961).

## Procedure

After assessment selected patients were kept fasting overnight and with proper consent offered fiber-optic bronchoscopy. Fiber optic bronchoscopy was done with Pentax Broncho Fibroscope Model FB-18 P, Japan/Karl Storz 11004 BC1, Germany. Pre-medication was done with injection Atropine sulfate and injection Promethazine and 2% lidocaine (xylocaine) solution used as local anaesthetic agent during the procedure. Fiber optic bronchoscopy was performed in every case per nasal or oral, to observe the changes in tracheobronchial tree and to obtain specimens.

Obtained specimens were subjected to following examinations:

- AFB smear examinations were done in bronchial aspirate and post bronchoscopic sputum at TB and Chest Hospital, Bari, Udaipur.
- AFB culture of bronchial aspirate done at department of microbiology, RNT Medical College, Udaipur.
- Cytology of Bronchial aspirate/washing and bronchial brushing, and histopathologic examination of bronchial biopsy done at Department of Pathology, RNT Medical College, Udaipur.

Reports were obtained and analyzed accordingly.

## RESULTS

The patients studied were between the age group 16-75 years. The majority of patients (87.7%) belong to the age group of 21 to 60 years. There were 50 male and 7 female patients in the study group. 61.4 % (35) of total patients under study were non-vegetarian and 38.59% (22) were vegetarian.

Out of 57 patients, 40% (23) were non-smoker, 33% (19) were smoker and 26.3% (15) were ex-smoker. 31.5% (18) patients were alcoholic and 68% (39) patients were non-alcoholic. All of 7 females were non-alcoholic. Thus the alcoholic habit was also far more in males as compared to females. The studied patients were also grouped according to domicile. 91% (52) patients belonged to the rural areas while 8 % were urban. The cough was the single most common presenting symptom (98.24%) followed by expectoration (86%), fever (71.9%), breathlessness (66%), chest pain and decrease appetite (56.14%) and haemoptysis (33.3%). Hoarseness of voice, dysphagia and

constitutional symptoms (24%), weakness, bodyache, malaise, etc. also observed.

**Table 1.** Patient characteristics

Patient characteristic	%	N=57
<b>Sex</b>		
<b>Male</b>	87.7	50
<b>Female</b>	12.2	7
<b>Mean age (years)</b>		
<b>Total</b>	43.07 ± 14.22	
<b>Male</b>	43.96 ± 14.13	
<b>Female</b>	36.71 ± 8.78	
<b>Mean duration of illness</b>	24.36 months	
<b>Symptoms</b>		
<b>Cough</b>	98.24	56
<b>Expectoration</b>	85.96	49
<b>Fever</b>	71.9	41
<b>Decrease appetite</b>	56.14	32
<b>Dyspnea</b>	66.66	38
<b>Haemoptysis</b>	33.33	19
<b>Chest pain</b>	56.14	32
<b>Other constitutional symptoms</b>	24.56	14
<b>Chest radiography</b>		
<b>Site of lesion</b>		
<b>Right</b>	35.08	20
<b>Left</b>	21.05	12
<b>Bilateral</b>	9.3	25
<b>Type of lesion</b>		
<b>Cavitary</b>	40.35	23
<b>Non cavitary</b>	59.64	34

Table no 2 shows the distribution of patients (who had taken ATT) according to gap between ATT and FOB. There was no gap between ATT and FOB in 26 (45.60%) out of 57 patients in 6 patients (10.50%) gap was less than 2 months

while in 25 patients (43.9%) the gap was 2 months or more than 2 months duration.

**Table-2: Distribution of patients who had history of ATT according to gap between ATT and FOB (n=57)**

Gap	No. of patients	Percentage
Nil	26	45.60
< 2 months	6	10.50
≥ 2 months	25	43.90
<b>Total</b>	<b>57</b>	<b>100.00</b>

Table no..3 shows diagnostic yield of fiber optic bronchoscopy for tuberculosis in patients who had history of ATT (n=57). Early positive yield for tuberculosis was 8.8% whereas overall positive diagnostic yield after culture results was 12.3%. Bronchial biopsy histopathology showed fibroid granuloma in one out of 6 patients (16.7%).

## DISCUSSION

In the era of rigid bronchoscopy, the rigidness of bronchoscope was causing more complication which limits the use of it for diagnostic purpose in tuberculosis patients. The fibre-optic bronchoscopy was a revolutionary invention for the diagnosis of lung diseases which make available different material like as bronchial aspirate, bronchial brushing, bronchial washing, bronchoalveolar lavage fluid, postbronchoscopy sputum and biopsy material for smear and culture for mycobacteria and other studies for diagnosis of pulmonary tuberculosis.

**Table-3: Diagnostic yield of fiber optic bronchoscopy for tuberculosis in patients who had history of ATT (n=57)**

Bronchoscopic procedure	Positive results		Exclusive positive	
	No.	%	No.	%
Bronchial aspirate/Washing smear	2/56	3.6	--	--
Bronchial biopsy (HPE)	1/6	16.7	1	16.7
PBS for AFB smear	3/54	5.6	1	1.85
Positive early yield for tuberculosis	5/57	8.8	--	--
Bronchial aspirate for AFB culture	3/47	6.4	2	4.3
<b>Overall diagnostic yield for tuberculosis after culture</b>	<b>7/57</b>	<b>12.3</b>	<b>--</b>	<b>--</b>

The present study was carried out on 57 sputum smear negative for AFB under RNTCP and radiologically suspected old cases of pulmonary tuberculosis, who had history of anti-tuberculous treatment of varying duration and their previous sputum status was not known, to evaluate diagnostic yield of fiber optic bronchoscopy.

By clinical presentation, cough (98.24%) was the most common presenting feature, followed by expectoration (86%), breathlessness (66%), chest pain (56%) and haemoptysis (33%). The physical findings such as pallor (57%), clubbing (55%), lymphadenopathy (8%) etc. were also observed. Majority of the patients (70%) had low body mass index (BMI). Clinical findings in the present study were consistent Holmes and Faulks study. (6)

Radiologically disease was minimal in 31%, moderately advanced in 44% and far advanced in 25% of the patients. Disease had bilateral distribution in 43.85 % of the patients and unilateral in 56%. Out of 57 patients, upper and mid zone involvement was found in 45% of cases and diffuse involvement in 32%, however lower-mid zone involvement was reported in 28% of cases. Cavitation was found in 40 % of cases, SPN in 2 %, bilateral hilar enlargement seen in one patient, associated pleural effusion in 2 patients, hydropneumothorax, pneumothorax and mediastinal widening found in one-one patient. Fibroproductive infiltration or exudative infiltrative shadow with or without consolidation was found in most of the patients (61%). Our findings were comparable to the findings observed by Woodring et al and Krysl et al.(7,8)

Woodring et al (1986) reported bilateral involvement in 32 - 64%, cavitation in 40-86% of cases, having multiple cavitation more common than single (54-76%) and also reporting mixed exudative and fibroproductive lesion in 79% of cases. They also found that in post-primary tuberculosis, exudative lesions (consolidation) were heterogeneous and illdefined, often involving more than one segment (88%). (7)

Bronchoscopically normal tracheobronchial tree was observed in 8.7% cases, whereas congestion/erythema, distortion of bronchi and narrowing 4 or obliteration of lumen 2 was found in 50.8%, 12.2% and 19.2% respectively. Secretions were present in 50.8%, growth seen in 10.5% and external compression in 3.5% of the patients. Widened carina and decreased movement or paralysed vocal cords were found in 14.3 % and 8.7% of the procedures

respectively. Similarly, Kulpati DDS and Heera HS (1986) reported generalized congestion/hyperemia in most of the patients.(9) Punda BN et al (1995) observed growth in 5% (5/100) and external compression in 3% (3/100) patients. (10) In contrary to present study, So SY et al (1982) found endoscopic visible lesions only in 18% of patients. (11) Purohit SD et al (1983) reported frothy secretions in 60% in the tracheobronchial tree while in the present study mucoid-mucopurulent secretions found in 68% (44/60). (12)

Early positive diagnostic yield for tuberculosis was 8.8% (5/57) and overall diagnostic yield after culture was 12.3% (7/57) in patients who had history of anti-tuberculous treatment of variable period with or without interruption before fiber optic bronchoscopic procedures. Lower yield in the latter group might be due to anti-tuberculous treatment as Kvale et al (1979) observed that 68% of patients with documented tuberculosis, one third of whom were receiving anti tuberculosis therapy, had negative bronchial wash specimens from fiber optic bronchoscopy.(13)

The smear results of bronchial aspirate were lower than the studies of Panda et al and Chan *et al* who reported it as 12% and 14% respectively.(10,14) In the present study, the bronchial aspirate culture yield for mycobacterium tuberculosis was 6.38 % (3/47) which was lower than Chan *et* who reported the yield at 93% and higher than that of Wallace et al who reported it as 4%.(14,15) It may be because we include only old cases and other scientist include both.



Positive post bronchoscopic sputum smear results for AFB were also lower than other studies of Jaiswal AK et al (1989) who observed it as 28%. (16)

In the present study results of histopathological examination of bronchial biopsies for tuberculosis were higher than that reported by Panda BN et al and Jaiswal AK et al (10% each) but lower than So et al (1982) who observed it at 58%. Possibly reason for that they did retrospective analysis of only the proven cases. (10,16,11)

In the present study it was observed that bronchial aspirate cytology had no significant correlation with the positive bacteriology. While correlating radiological lesion and positive bacteriology it was observed that patients with bilateral lesion had more incidence of positive bacteriology as compared to unilateral lesion, whereas more positive bacteriology cases were observed among minimal and moderately advanced, non-cavitary lesion carrying patients rather than the ones carrying far advanced and cavitary lesions. This observation may be explained by the fact that the patients with far advanced, cavitary lesions are more probable of having taken ATT.

In preliminary study, it was found that bronchial brushings seldom provided positive smear, so subsequently it was omitted.

In the present study no major complication or mortality was observed, only minor complications were observed in 4 patients (transient bleeding-2 and cough-2) for which no active management was required; which is similar with studies viz. Jaiswal et al and Sarkar et al.(16,17)

The values of diagnostic yield for bronchial aspirate, post bronchoscopic sputum and bronchial biopsy cannot be compared with those reported in literature as:

1. In almost all the previous studies sputum smear examination were done under non-DOTS. There were no previous studies in which 3 sputum smear examinations for AFB were done under RNTCP.
2. In most of the previous studies only fresh (New) cases were taken into study or no information was provided regarding previous anti-tuberculous treatment status.
3. Most of the previous studies were retrospective in nature and tuberculosis proven cases were taken into consideration for analysis.

All the above mentioned factors could be the reason for high diagnostic yield in the previous studies. While in present study, patients who had 3 sputum smears negative for AFB under RNTCP and radiologically suspected cases of pulmonary tuberculosis, irrespective of previous anti-tuberculous treatment (ATT) status, were included. This could be one of the probable reason for the lower positive yield reported in the present study.

**CONCLUSION:** In conclusion, bronchoscopic procedures was found to be relatively safe and diagnostic yield for pulmonary tuberculosis was 8.8 % in the sputum smear negative under RNTCP and radiologically suspected cases of pulmonary tuberculosis.

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## ASSESSMENT OF CORRELATION BETWEEN OBESITY AND BARRETT'S ESOPHAGUS IN A POPULATION OF URBAN AREAS OF UDAIPUR

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### Abstract

**Background:** - The main risk for Barrett's esophagus (BE) is considered to be gastro esophageal reflux disease (GERD). The correlation between obesity and Barrett's esophagus (BE) in urban areas of Udaipur {Rajasthan} is studied in present study in patient visiting Geetanjali Medical College, Udaipur.

**Material & method:-** A cross-sectional study had been carried out from January 2013 to September 2013 at Geetanjali Medical College & Hospital, Udaipur in which 1080 subjects who underwent upper gastrointestinal endoscopy and the prevalence of endoscopically suspected BE was evaluated. Obesity was evaluated by body mass index (BMI,  $\geq 25 \text{ kg/m}^2$ ) and waist circumference (WC) (males,  $\geq 85 \text{ cm}$ ; females,  $\geq 90 \text{ cm}$ ). Since the endoscopic diagnosis of short endoscopically suspected BE ( $<1 \text{ cm}$  in extent) is difficult therefore it was excluded from the study. **Result:-** In present study by generating data and by analyzing it was came out that obesity (BMI, WC) is not independently a risk factor for barrett's oesophagus and results are non significant (p value  $>0.05$ ). In contrast; the reflex eosophagitis (RE) significantly found as a risk factor (p value= 0.00) **Conclusion:-** Reflex eosophagitis but not obesity may have an independent association with the risk of endoscopically suspected BE. Furthermore, obesity measures were not independent risks for RE.

**Keywords:-** Barrett's esophagus, Body mass index, obesity, Reflux esophagitis

### INTRODUCTION

The main risk for Barrett's esophagus (BE) is considered to be gastro esophageal reflux disease (GERD). (1) In present world there is an increase in prevalence of barrett's esophagus per decade and the incidence rates are also increasing. (2) In contrast few studies have been done before for association between RE and BE have found a positive association. (3)

Previous studies on the correlation between obesity and RE or BE have been limited to retrospective studies. (4) Hence, it is controversial whether obesity is actually an independent risk factor for BE or not. gastroesophageal junction , the distal end of the esophageal palisade vessels versus the proximal margin of the gastric folds. (5) BE diagnosis

requires histological confirmation of the specialized intestinal metaplasia (SIM). Thus, cases without histological confirmation of SIM are defined as endoscopically suspected BE (ESBE) in the US, but are not regarded as BE. (6) In most of the BE cases identified the lesions were very short, i.e., < 1 cm in length. Such cases are classified as ultra-short BE, although the diagnosis of this disease entity is difficult and highly unreliable. (7) Some previous studies have included patients who were taking proton pump inhibitors (PPIs), which may induce the regression and normalization of BE. Thus, the associations between obesity and BE should be investigated separately in patients taking and those not taking PPIs. (8)

## MATERIAL & METHOD

The present study is a hospital based cross-sectional study had been carried out from January 2013 to September 2013 at Geetanjali Medical College & Hospital, Udaipur in which 1080 subjects who underwent upper gastrointestinal endoscopy and the prevalence of endoscopically suspected BE (ESBE) was evaluated. Most patients were out door patients, and patients who were previously undergone upper gastrointestinal tract surgery and who were previously undergone endoscopy and those who were followed in the surveillance of BE were excluded from the present study. BMI was calculated as weight divided by the square of height ( $\text{kg}/\text{m}^2$ ). "Obesity" was defined as  $\text{BMI} > 25.0 \text{ kg}/\text{m}^2$  (9) , Along with Waist Circumference based on the criteria (> 85 cm for men and > 90 cm for women) was defined as an abnormal WC.

In this study at our hospital the transnasal endoscopy with an ultrathin endoscope was performed. A standardized questionnaire was used to obtain a history from each subject regarding GERD symptoms, smoking and alcohol habits prior to endoscopy. The history of Proton pump inhibitors (PPIs) was asked by self-report and a review of the medical prescriptions in our database. From all the patients prior to this study a written informed consent was obtained. In the present study ESBE was diagnosed as columnar-lined epithelium between the lower end of the palisade vessels of the lower esophagus and the squamo-columnar junction, but if the palisade vessels could not be visualized, then the upper end of the gastric folds was regarded as the GEJ. When the ESBE length was considered to be 1 cm or more, the length was measured in comparison to the length of the endoscope reciprocally if the length was <1.0 cm, the ESBE length was judged in comparison to the biopsy forceps. Data were prospectively collected and evaluated in MS excel and SPSS version 16.

## RESULT

About 1080 individuals participated in the present study with prior consent of subject himself. We included only 20 to 80 years individuals for the ease of study.

Out of them 570 were males and 510 were females. In the selected subjects 194 subject were not taking proton pump inhibitors and the rest of 886 subjects taking proton pump inhibitors.

**Table 1: Distribution according to gender and age of the subjects.**

Age (years)	Male (%)	Female (%)	Total (%)
20-40	160(28.1)	151(29.6)	311(28.8)
40-60	210(36.8)	174(34.1)	384(35.5)
60-80	200(35.1)	185(36.3)	385(35.6)
<b>Total</b>	<b>570(100)</b>	<b>510(100)</b>	<b>1080(100)</b>

All subjects evaluated on the basis of risk factors i.e. reflex esophagitis, and obesity by the mode of BMI and WC. Results have shown no significant association of obesity and ESBE in present study means (p value >0.05). In contrast the results were significant in those who were presented with RE means (p value = 0.00).

**Table 2: Impact of obesity and RE on The occurrence of Barrett's esophagus in subjects based on taking and those who were not taking PPIs.**

Subjects with Risk factor developing ESBE	Total no. of subjects examined for ESBE (n=1080)		P Value
	Not on PPIs (n=194)	On PPIs (n=886)	
RE	42(21.6%)	121(13.7%)	0.00
BMI >25,kg/m <sup>2</sup>	36(18.6%)	134(15.1%)	0.23
WC>90,cm	03(0.01%)	13(0.01%)	1.00

The present study is a preliminary study and provides a snapshot of association between Barrett's esophagus and obesity along with reflux esophagitis, more elaborate pragmatic studies needed to get a clear picture of the correlation in urban and rural areas of Udaipur district.

## DISCUSSION

A previous study reported that high WHR but not BMI, was associated with a significant increase in the risk of LSBE but not short-segment BE in white men (10). The present study is the hospital based cross-sectional study using endoscopic data collection to evaluate the association between obesity and the risk of ESBE, especially short-segment ESBE were investigated separately in subjects taking and those not taking PPIs in order to exclude the possibility of a drug affecting the pathophysiology of BE. RE is incompletely understood in its natural history because very few well-designed prospective studies and endoscopic studies in general populations have been performed (11). In the current study RE was a significant risk factor for ESBE development. In the present study clearly stated that RE was an independent risk factor for ESBE, while obesity was not a risk factor for RE. A previous study by Corley et al. says that differences in body fat distribution, rather than simple obesity as measured by the BMI, may cause GERD or BE, with abdominal fat deposition leading to an increase in intra-abdominal pressure and GERD, In contrast to that WC may predict the risk of BE or esophageal adenocarcinoma better than BMI

(12). The difference in the association between obesity and RE or BE might be explained, at least in part, by ethnic differences in the obesity pattern, especially the pattern of visceral adipose tissue deposition (4). One of the possible mechanism for the development of ESBE  $\geq 1$  cm in subjects may be that visceral obesity as measured by WC is associated with severe esophageal acid exposure that cannot be properly inhibited by PPIs treatment alone. That's why; 24-hour esophageal pH monitoring will be needed to further evaluate the mechanism in such patients. The WC in females differs from that in males because there is a difference in the preferential accumulation of VAT between females and males. Hence, the risk factors for BE development may be different between females and males. But, there was no association between obesity and RE and ESBE was found out in either females or males in the present study. Further elaborate studies and investigation required using a larger series of samples to determine the association between gender and BE. The present study had several potential limitations. A possible weakness is that only ESBE without histological confirmation of SIM was evaluated. Further more studies will be needed to accurately clarify the association. Second, present study was a hospital based study, so the pooled data might not represent the general population. In addition, with that, our sample size was relatively small. Third, it was not established whether any of the endoscopic BE patients had a hiatus hernia (may be a risk factor of BE development itself), H. pylori infection (may have an inverse association with BE). Along with that, we did not evaluate the administration of nonsteroidal anti-inflammatory

drugs, including aspirin, which have been significantly associated with a risk of BE (13).

## CONCLUSION

In present study obesity were not risk factors for ESBE and it was found out that RE was the only one of the parameters studied that was a significant risk factor for ESBE independent of obesity. Further studies with a larger sample size will be needed to clarify the reason for this lack of association between obesity and ESBE in the urban and rural population of Udaipur district.

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## COMPARISON OF LIGNOCAINE 1.5% ALONE AND LIGNOCAINE 1.5% WITH TRAMADOL FOR POST OPERATIVE EPIDURAL ANALGESIA

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### ABSTRACT

**Objective:** Aim of this study was to establish new synthetic opioid analgesic Tramadol as better agent for post operative pain relief. **Material and Methods:** Study consists of 25 patients undergoing lower abdominal surgeries with the epidural anaesthesia supplemented inj. Tramadol for post operative pain relief. Effect of drug on vital parameters, onset and level of block, muscle relaxation were taken as indicators of study. **Result:** Tramadol when mixed with lignocaine was better tolerated without interfering each other. Duration and quality of anaesthesia was not affected. The age, gender and type of surgery had well correlation in both groups. The vitals as pulse, BP (systolic and diastolic), respiratory rate were raised in-group 2 (lignocaine alone) and significant prolongation of duration of analgesia  $544.48 \pm 182.94$  min in group 1 than  $62.44 \pm 13.82$  min in group 2 was noted. **Conclusion:** The newer synthetic opioid analgesic tramadol with atypical clinical profile can be used epidural safely with rapid onset, effective and prolonged post operative analgesia allowing cardiovascular, respiratory stability and minimum side effects as well high acceptability.

**Keywords:** post operative epidural analgesia ,opioid analgesic, postoperative pain relief

### INTRODUCTION

Pain an unpleasant sensation which only an individual can appraise and hence cannot be precisely defined as it is only the individual suffering from it who perceives it, not the observer. (1) The relief of pain during surgery is the "Raison d etre of Anaesthesia which should be appropriately in to the post operative period. The identification of opiate receptors in substantia gelatinosa of posterior horn cells of the spinal cord opened a new era in pain relief. (2) In regional anesthesia major development was the adoption of Tuohys catheter technique devised for continuous spinal anesthesia to

epidural anesthesia by Curbello. (3) Simpson et al (1961) and Bromage (1967) emphasized the superiority of epidural anesthesia over other techniques for relieving post operative pain. (4,5) With the knowledge about pain receptors, transmission and pathways opiates and other narcotics have been used along with regional anesthetic agents for post operative pain relief through intrathecal and epidural route.

Tramadol is introduced by Grunenthal in late 1970s in German market as a weak opioid with atypical clinical profile. (6, 7) It interacts with opioid receptors ( $\mu$ ,  $\alpha$ , and  $\delta$ ) through



active metabolite O-demethyl Tramadol. The apparent lack of tolerance and dependence with low incidence of respiratory depression suggests its advantage over other established opioids. It is found one thirtieth as potent as morphine in post operative pain relief (PCA) in lower abdominal surgeries and even more effective than epidural Bupivacaine. (8) The absence of respiratory depression in comparison to morphine may be attributed to different mechanism of action with efficacy equivalent to pethidine.(9) In the view of above limited research and ample of scope and advantage it is decided to evaluate post operative pain relief through epidural Tramadol.

## MATERIAL AND METHODS

Study consists of 25 patients undergoing lower abdominal surgeries with the epidural anaesthesia supplemented inj. Tramadol for post operative pain relief. Effect of drug on vital parameters, onset and level of block, muscle relaxation were taken as indicators of study.

## RESULT

Clinical evaluation of post operative analgesia by epidural Tramadol in lower abdominal surgeries shows significant decrease in pulse rate and systolic BP observed in group 1 as compared to control group 2. The mean time of onset of analgesia was  $14.08 \pm 3.49$  min in group 1 as compared to  $12.96 \pm 3.43$  min in group 2. The mean duration of action of pain relief was in group 1  $544.48 \pm 182.94$  min and  $62.44 \pm 13.82$  min in group 2 patients. The side effects noted only in 16% patients were nausea and vomiting which were not serious and alarming, treated symptomatically.

## DISCUSSION

The present study was done to evaluate post operative pain relief by adding Tramadol hydrochloride with Lignocaine 1.5% through epidural approach. Relief of pain during surgery is the "Raison d etre of anaesthesia" which should appropriately be extended in to the post operative period. In this context, Hippocrates said."Divine is the task to relieve pain" Pain receptors appear to consist of peripheral plexus of non myelinated nerves activated by high intensity stimuli, which may be thermal, mechanical, electrical or chemical. Pain is conducted by 2 types of fibers in periphery the A-delta (myelinated, rapidly conducting at 12-30 m/sec for well localized the quickly) and C fibers (non myelinated, slow conducting at 2-3 m/sec for delayed felt pain)

Peripheral sensory nerves have their cell bodies in DRG and their central projections enter the dorsal horn in lateral division of dorsal root principally terminating in rexed laminae 1 & 2 (substantia gelatinosa). Then the nociceptive impulse are conducted to thalamus via the spinothalamic tract with substance P as neurotransmitter. Collaterals supply medulla and central gray mater. Enkephalin (or morhin like transmitters) activates descending serotonergic and noradrenergic pathways that inhibit primary afferent transmission. Within dorsal horn there are local endorphins –enkephalin (opiates) inhibitory system. These same receptors are responsible for inhibitory effects of opioids analgesic on pain level.

A new concept has been opened for relief of postoperative pain since the identification of

specific opiate receptors by Synder in substantia gelatinosa of post horn cells of spinal cord. **(10)**

Tramadol Hcl, the newly introduced opioid agonist with atypical clinical profile has been used epidural for relief of post operative pain. **(7)** The absence of clinically relevant respiratory depression following epidural morphine may be attributed to different mechanism of their analgesic action. **(11)** It can be used to produce post operative analgesia without serious side effects. **(11, 12)**

In our study fifty patients (ASA class 1 & class2) were selected for routine planned surgery below the level of umbilicus.

The patients were divided in to two groups of 25 each. Cases in group 1 constituted the study group received inj. Tramadol (50 mg)1 ml along with inj. Lignocaine (1.5%)14 ml with single shot epidural approach. Group 2 allocated as control group received inj. Lignocaine alone 1.5 % (15 ml) similarly.

In this study all cases selected at random to avoid any kind of bias and allow comparability of results obtained in two groups. Patients selected were between 40-70 years with male preponderance in both groups equally. Mean age in group1 was 43.6±14.24 years and in group2 41.6 ±12.98 years. In all patients after injection epidurally all parameters recorded in similar manner in both groups.

In the present study it was found that group 1 patients had pulse rate range 70-90 /min and mean change 81.68± 6.55 / min to 81.28±6.13 /min in group 1 which is statically significant ( $p < 0.05$ ). On other hand in group2 range (74-100) with mean change preoperative 82.56±8.30 /min

to 84.72±7.21 /min post operative which is also statistically significant ( $p < 0.05$ ).

Group 1 patients had mean systolic BP 121.6±11.43 mmHg pre operatively to 119.6±9.35 mm Hg post operatively while in group 2 patients it was increased from 122.48±6.04 mm Hg to 124.56±6.77 mm Hg which is statistically significant ( $p < 0.05$ ). Similarly diastolic BP change in group1 was 79.20 ±6.88 mmHg to 79.44 ±5.37 mm Hg and 80.48 ±6.69 mm Hg which is statistically insignificant ( $p > 0.05$ ).

In a study by Rud V et al no significant change in pulse and BP observed. **(13)** Study conducted by Hackl W et al pulse rate was found to be increased slightly but significantly following the use of opiates than Tramadol. **(14)** Fentanyl produces a significant drop in mean arterial pressure by a maximum 16%.

Lehmann K.A et al carried out a randomized double blind study of Tramadol as an intra operative analgesia in comparison with placebo. **(15)**

Mean respiratory rate change observed pre operatively in group 1 was 14.36±1.15 /min to 14.21±1.17 /min and in group 2 14.28±1.06 /min to 14.76±1.13/min which is not statistically significant ( $p > 0.05$ ).

The opiate nature of Tramadol may be responsible for respiratory depression. Although study of Baraka et al found lack of clinically associated respiratory depression following epidural tramadol compared to epidural morphine. **(12)** Study of Husslein P et al in obstetrics cases compared pethidine with

tramadol found ventilator frequency higher in new born in tramadol group than pethedine. (16)

Hackl W et al declared significant drop in respiratory rate after on demand analgesia by computer for tramadol and fentanyl. (14)

Time of onset of sensory loss can be calculated by pin prick sensation in each dermatome on both side of body or by using an alcohol swab to assess loss of temperature sensation. (17, 18) Mean time of sensory loss as per Nunn, Utting and Brown: General anaesthesia 1989 is 5- 15 min. (19) In our study it is  $14.08 \pm 3.49$  min in group 1 and  $12.96 \pm 3.43$  min in group 2 which is comparable and statistically insignificant.

The level of sensory block in both groups varied from T9 to L1 as per spinal segments correspondence to type of surgery.

The mean time of onset of motor loss was  $23.2 \pm 5.37$  min in group 1 and  $25.4 \pm 5.93$  in group 2 patients ( $p > 0.05$ ) statistically insignificant. Time of onset of motor loss is reported to be 20-30 min. (20) Bromage scale is used to calculate time of onset of motor loss. (5)

The mean duration of surgery was 47 min  $\pm 22.82$  min in group 1 as compared to  $48.4 \pm 27.33$  min in group 2 patients. ( $p < 0.05$ ) With epidural anaesthesia, a characteristic feature of each local anaesthetic is its "time to two segments regression" i.e. the time from injection to time of maximum sensory level regression two segments. This is 90 to 150 min with lignocaine and epidural lignocaine allow surgery for 60-75 min. (1, 21)

All patients were supplemented with oxygen (4 liter) with ventimask intra operative. Patients

having pain sensation intra operatively were supplemented with antonox 50:50 O<sub>2</sub>:N<sub>2</sub>O. Supplementation is considered as one of the important steps in smooth conduction of epidural anaesthesia and should be done in a way no discernible either to the patient or to the surgeon in the interest of maintaining acceptability of the technique. Fu YP et al found average duration  $11.3 \pm 4.8$  hrs with epidural tamadol (75mg). (22, 23) In a study Delilkan AE & Vijayan R mean duration with epidural tramadol (100mg) was 9.36 hrs. (24)

AK Pan, Mukherjee, A rudra studied epidural tramadol 50 mg with lignocaine(2%) and significant improvement in duration of pain relief from  $2.46 \pm 0.54$  hrs to  $15.39 \pm 0.45$  hrs. (25) Pinky et al studied epidural tramadol 100 mg and significant improvement in duration of pain relief. In our study no significant side effects were observed which were serious and alarming. (26)

## CONCLUSION

It is therefore concluded that the newer synthetic opioid analgesic Tramadol with atypical clinical profile can be used epidural safely for rapid onset, effective and prolonged post operative analgesia allowing good cardio vascular and respiratory stability with minimum side effects and high acceptability.

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**Ethical approval:** The study was approved by the institutional ethics committee

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## A NEW BIOCHEMICAL MARKER : SERUM ADENOSINE DEAMINASE ACTIVITY FOR ASSESSMENT OF SEVERITY IN ULCERATIVE COLITIS PATIENTS

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### ABSTRACT

**Objective:** Adenosine deaminase (ADA) is known as a key enzyme in purine metabolism and DNA turnover. Although ADA has been shown to increase in several inflammatory conditions, there are less studies signifying a change in UC. Ulcerative colitis (UC) is a chronic inflammatory disease characterized by recurrent inflammation and ulcerations of colonic mucosa and an inappropriate and delayed healing.

**Material and Methods:** This study evaluated the activity of total ADA in serum of 50 patients with UC and 25 healthy controls. Patients' age, disease duration, drug intake, and other medical history were all noted for each subject. Complete blood count, and ADA were determined for both patients and controls.

**Result:** Serum mean ADA levels were  $16.22 \pm 5.91$  and  $9.24 \pm 2.19$  U/l for patients with UC in active state and in remission and  $9.64 \pm 3.37$  U/l in the healthy control group. Mean serum ADA levels were significantly elevated in active UC patients compared with patients with UC in remission and control groups. **Conclusion:** Serum ADA levels were found to be elevated in UC patients in active state suggesting a partial role of activated T-cell response in the disease pathophysiology. Further randomized controlled studies are warranted to demonstrate the role of the ADA in UC patients, with a special interest in specifically targeted therapies against ADA for achieving disease remission.

**Keywords:** Adenosine deaminase, Ulcerative colitis, Disease activity.

### Introduction

Ulcerative colitis (*Colitis ulcerosa*, UC) is a form of colitis which is classified as inflammatory bowel disease (IBD). Ulcer or open sores on colon is characteristic feature of UC. The Periods of remission interpose by clinical exacerbations during the clinical course is a challenge for treating clinicians.

The differential diagnosis of UC can be done with endoscopy and mucosal biopsy for histopathology. Laboratory investigations and imaging tests are also useful for the correct diagnosis. (1) Severity of UC is defined as mild moderate severe and fulminant. (2) Severity decides the management of UC that UC is managed by either medical therapy or surgery.

Though availability of advance medical therapy from last decades, the rate of colectomy has decreased but the surgery maintains its importance in the therapeutic management in severe UC. (3) It is expected that the early recognition of disease severity will considerably bring down the surgery rate and hence will decrease mortality in serious UC patients. (4) Laboratory tests, Like white blood cells (WBC), erythrocyte sedimentation rate (ESR), C-reactive protein (CRP) are being broadly accepted as routine investigation, for preliminary diagnosis and to monitor activity in UC. However, a specific test is not available till yet. (5) This is the reason which motivates us to find out an additional serum biomarker for assessment of severity and approaching a precise diagnosis.

Adenosine deaminase (ADA) is a key enzyme in purine catabolism. (6) ADA is biologically active in lymphoid tissue and plays an important role for proliferation and differentiation of T lymphocytes, blood monocytes and macrophages. (7) The estimation of ADA activity in the serum and other biologic fluids is very helpful in diagnosis of many inflammatory conditions and disease such as rheumatoid arthritis (RA), acute appendicitis, systemic lupus erythematosus (SLE), celiac disease (CD) and tuberculosis. (8, 9, 10, 11, 12)

## MATERIALS AND METHODS

### Patients

Fifty patients with UC and 25 healthy controls coming at the Gastroenterology outdoor of Geetanjali Medical College and Hospital, Udaipur between February 2013 and August 2013 were included in the study. The diagnosis of UC was made on basis of clinical history, typical radiological, endoscopic and histological criteria. Patient's age, disease duration, drug intake, other medical and personal history was

recorded for every subject. Complete blood count and ADA were measured for both patients and controls. Colonoscopy was done for all patients.

All patients of UC were classified in two groups according to Disease activities and it was calculated according to endoscopic activity index (EAI) scores. (13)

Active UC -Patients with EAI scores  $\geq 4$

Inactive UC - Patients with EAI scores  $< 4$

### Serum samples

Blood samples were collected from a peripheral vein after an overnight fast without using any anticoagulant and were subjected to centrifugation with the speed of 3000 rounds per minute for 10 min (Remi). Serum was analyzed immediately.

### ADA assay

Total serum ADA was estimated with an auto analyzer (Cobas c311, Roche, Basel, Switzerland). Serum ADA activities were estimated by the method of Giusti and Galanti. (14) Briefly, samples were incubated with adenosine and the released ammonium ions were determined. ADA activity was defined as the concentration of ammonium ions (mol/l) formed in 1 min and expressed as units per litre.

### Statistical analyses

Values were demonstrated as mean  $\pm$  standard deviations. Comparisons of percentages between different groups of patients were carried out using the chi-squared test. All normally-distributed data were analyzed using unpaired Student *t* test or 1-way analysis of variance (ANOVA; for 3 groups). A p-value of  $< 0.05$  was deemed statistically significant.

## RESULTS

Fifty patients with UC and 25 control subjects were included in this study. There were 20 females and 32 males in the UC group and 11 females and 14 males in the control group ( $p=$

0.485). Table 1 represents the demographic and clinical characteristics of patients and control subjects. The age, gender and smoking of the subjects were not found statistically significant differences

**Table 1. Demographic features of the patients and controls.**

		Active UC (n=25)	Inactive UC (n=25)	Controls (n= 25)	p
<b>Age (Year)</b>		54.24 $\pm$ 14.86	57.6 $\pm$ 15.56	63.32 $\pm$ 11.24	0.075
<b>Gender (F/M)</b>	Female	12(48%)	8(32%)	11(44%)	0.508
	Male	15(60%)	17(68%)	14(56%)	
<b>Disease duration (months)</b>		29.36 $\pm$ 11.50	27.96 $\pm$ 9.58	--	
<b>Smoking</b>	Yes	9	4	8	0.431
	No	16	21	17	
<b>Disease localization</b>					
<b>Distal colitis, n (%)</b>		9	11		
<b>Left, n (%)</b>		10	8		
<b>Pancolitis, n (%)</b>		6	5		

The mean serum ADA levels of UC patients and controls were 12.73  $\pm$  5.65 and 9.64  $\pm$  3.37 respectively ( $p=0.00141$ ). Serum ADA levels of active UC (16.22  $\pm$  5.91 U/l) patients were significantly higher than those of inactive UC (9.24  $\pm$  2.19U/l ( $p<0.001$ )). Table 2 shows serum

ADA and the other laboratory values of study participants at onset of the study. No correlation was found between ADA and WBC and also ADA and HB. (WBC:  $r=0.026$ ,  $p<0.902$ ; HB:  $r=0.004$ ,  $p=0.98$ ).

**Table 2. Comparison of serum ADA levels with other laboratory markers between patients and controls.**

	Active UC (n:25)	Inactive UC (n:25)	Controls (n:25)	P
<b>ADA (U/l)</b>	16.22 $\pm$ 5.91	9.24 $\pm$ 2.19	9.64 $\pm$ 3.37	0.0001*
<b>Hemoglobin (g/dl)</b>	13.18 $\pm$ 2.06	13.99 $\pm$ 2.53	14.33 $\pm$ 2.6	0.201
<b>WBC (/mm<sup>3</sup>x10<sup>3</sup>)</b>	9.73 $\pm$ 1.99	6.85 $\pm$ 1.99	6.52 $\pm$ 2.02	0.0001*

ADA: Adenosine deaminase, WBC: White blood cell,



## DISCUSSION

Our study showed that concentration of ADA was significantly elevated in active UC in relation to inactive UC and healthy controls. The serum ADA was more accurate to define activity of UC than Hb and white blood cells. A high value in the serum ADA activity in UC patients are likely to reflect, at least in part, changes in the immunological status that occurs throughout the course of UC. However, to our current knowledge, there have only been few studies providing the reference values of serum ADA activity during UC. (15)

The clinical course is marked by exacerbations and remissions, which may develop spontaneously or in response to medical treatment.(16) A great majority of patients are generally mildly active and have a self-limiting disease; some will develop disease associated with serious complications. Approximately 30% of UC patients will need to undergo surgery at some point during their lifetimes for these complications. The determination of inflammatory activity has a significant role for the assessment of disease severity and for the therapeutic management. Since effective therapy significantly diminishes mortality in patients with severe UC, determination of inflammatory activity is therefore crucial for the assessment of disease activity and also for the tailoring of therapy.(17,18,) Although lower gastrointestinal endoscopy, histological findings and radiological imaging modalities are commonly used to monitor intestinal inflammation, a great number of invasive/non-invasive methods have also been studied for UC diagnosis and determining the

disease activity.(19,20) Elucidation of the associations between serum ADA activity and UC may help a better understanding toward the enigmatic pathogenesis of inflammatory bowel disease (IBD).

In our study, serum ADA levels were found to be significantly high in patients with active UC and patients with inactive UC to control group. Beyazit Y et.al also found increased serum ADA level in patients with active UC and patients with inactive UC to control group. (15) However the rise was much higher in patients of active UC. The significant finding in our study was, clinically inactive UC have also shown high serum ADA level but serum ADA level at par with active UC.

ADA is a polymorphic enzyme that is involved in purine metabolism and DNA turnover which is widely distributed in tissues and body fluids. (21) It is ubiquitous in mammalian tissue with the highest concentration in lymphoid tissues. Adenosine deaminase plays a crucial role in lymphocyte proliferation and differentiation and shows its highest activity in T-lymphocytes.(7,22) The high plasma adenosine deaminase activity might be due to abnormal T-lymphocyte responses or proliferation; may point towards a mechanism that involves its release into circulation.(22) Giblett et al. was the first study that demonstrated the vital and putative role of ADA on the immune system's function in patients with severe combined immunodeficiency.(23) Moreover as a sign of cell-mediated immune response, serum concentrations of ADA have been proposed to be elevated in several inflammatory and autoimmune conditions including infectious

diseases, rheumatoid arthritis (RA), acute appendicitis, systemic lupus erythematosus (SLE), celiac disease (CD) and tuberculosis and Graves' disease.(8,9,10,11,12,24)

In a recent study by Maor et al, it has been demonstrated that serum total ADA levels were also elevated in active CD. (25) They mentioned that after remission ADA levels decrease and approaches to normal values. Although lymphocytic differentiation and proliferation or the monocyte-macrophage cell system have been considered to be responsible for the alterations in serum ADA activity, the precise mechanisms by which serum ADA activity is changed have not been clarified yet.(26)

Ulcerative colitis and CD are both characterized by enhanced recruitment and retention of effector macrophages, neutrophils and T cells into the inflamed areas of intestine, where they are activated and release proinflammatory cytokines. Accumulation of effector cells in the inflamed intestine is a result of enhanced recruitment as well as prolonged survival triggered by decreased cellular apoptosis. (27) Although these immunological reactions set off in the course of immune disturbances in UC are imperfectly understood; activated macrophages and enhanced stimulation of T cells seem to be implicated in inflammation in UC. In the present study high levels of ADA in active UC patients suggest an action by cytokine release via T-cell activation, playing a key role in the inflammation process.

#### **CONCLUSION:**

The present study demonstrated that ADA levels were significantly elevated in active UC patients. We believe that ADA activity may be considered

as an efficient marker of UC and it could probably be a potential indicator of disease activation. If our data can be confirmed with further studies, we believe that a standardized cut-off value would facilitate the diagnosis of UC activation. Extensive studies dealing with T-cells and ADA activity are required to document the role of ADA in the immunopathogenesis of UC.

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**Ethical approval:** The study was approved by the institutional ethics committee

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## CLINICAL EVALUATION OF FLEXIBLE FIBEROPTIC BRONCHOSCOPE IN DIAGNOSIS OF NEW CASES OF SPUTUM SMEAR-NEGATIVE PULMONARY TUBERCULOSIS (SSN-PTB)

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### ABSTRACT

**Background:** Bronchoscopy is very useful for diagnosing of Sputum smear-negative pulmonary tuberculosis (SSN-PTB). Our aim is to find out the diagnostic yield of fiberoptic bronchoscopy in sputum smear negative under RNTCP and radiologically suspected new cases of pulmonary tuberculosis and the complications of fiberoptic bronchoscopy. **Material and Methods:** It is a cross-sectional prospective study in which consecutive 43 patients were enrolled in the present study at Department of Tuberculosis and Chest Diseases, RNT Medical College, Udaipur from 1<sup>st</sup> July 2005 to 7<sup>th</sup> July 2006. The patients whose three-sputum smear for Acid Fast Bacilli was negative and chest X-ray suggestive of pulmonary tuberculosis were included into the study. Patient's history, observations on physical examination and relevant investigations were noted. Fiberoptic bronchoscopy was carried out. **Results:** The diagnostic yield of fiber optic bronchoscopy for tuberculosis in new cases. Positive early diagnosis was done in 5 cases (11.6%) whereas, overall yield for AFB after bronchial aspirate culture was 8 out of 43 patients (18.6%). **Conclusions:** Our study suggests that fibre-optic bronchoscopy can provide excellent material for diagnosis of suspected cases of pulmonary tuberculosis when smears of expectorated sputum do not reveal mycobacteria. Fibre-optic bronchoscopy combined with transbronchial lung biopsy helps in early diagnosis of smear negative pulmonary tuberculosis and can differentiation of other disorders which clinical picture mimics tuberculosis.

**Key words:** Sputum smear-negative pulmonary tuberculosis (SSN-PTB), Fiberoptic bronchoscopy,

### INTRODUCTION

Tuberculosis is the most common cause of death from the infectious diseases at global level, is being second only to HIV/AIDS. It accounts for over a quarter of avoidable deaths worldwide.

Most deaths occur in developing countries and affect the young in productive years of their life.(1) Prevalence of radiologically active abacillary (sputum smear negative) pulmonary

tuberculosis is estimated 16 per 1000 with total number 13.6 million cases (2)

Although detection and cure of smear positive tuberculosis remains the foremost priority of a tuberculosis control programme, diagnosis and management of smear negative tuberculosis cannot be over looked.

In recent years smear negative tuberculosis is being reported more frequently with HIV co-infection (3) especially in respect of India where half of the nearly 4 million HIV infected individuals are also bearing the tuberculosis infection.(4) If left untreated about 35 % of smear negative symptomatic may develop active tuberculosis over a 2 year period .(5)

Sputum smear and culture examinations still remain the commonly practiced investigations in the diagnosis of pulmonary tuberculosis. It is also known that in many patients, this stringent criterion cannot be satisfied due to factors like:

- (a) lack of sputum production,
- (b) low bacterial yield, and
- (c) incorrect or improper sampling.

There are many factors that produce false negative smear results in patient with pulmonary tuberculosis. In under resourced, over worked

TB Control Programmes, laboratories cannot cope with the influx of diagnostic and follow up smear examination and smears may not be done at all. For example, in Botswana in year 1992, 48% of patients reported with pulmonary tuberculosis had no smear examinations performed. (6)

Other causes of sputum smear false negative are inadequate quantity, quality or number of sputum specimen to be examined, poor staining techniques and overly thick slides.

Published observations suggest that over 50% of smear negative patients would be needing chemotherapy by 12 months if left untreated.(7,8) Data from longitudinal surveys from Bangalore district, India (9) indicate that at 18 months of follow-up, the mortality rate for smear negative, culture-positive cases was 14.1% compared with the 34.7% observed in smear-positive patients. Thus, early diagnosis of active SSN-PTB disease is also important in certain situations. However, sputum smear-negative pulmonary tuberculosis (SSN-PTB) still remains a common problem faced by the clinicians. This is particularly true in the case of children who are unable to produce an adequate sample of sputum, patients with immunosuppressed states such as those with HIV, infection and the acquired immunodeficiency syndrome (AIDS) in whom SSN-PTB is quite common. ATT is frequently started empirically in sputum negative and radiologically suspected cases. This strategy is useful in most of the cases with the advantage of avoiding invasive diagnostic procedures and an early treatment is beneficial to the patient. However, diseases like bronchogenic carcinoma, diffuse lung diseases etc. are sometimes missed and cases are put within the gray area of tuberculosis suspect this may lead to delay of treatment resulting in poor outcome.(10)

In the earlier days of rigid bronchoscopy, patients with tuberculosis were seldom subjected to bronchoscopy for diagnostic purpose. With the advent of fibre-optic bronchoscopy, smear and culture for mycobacteria from the bronchial

aspirate, bronchial brushing, bronchial washing, bronchoalveolar lavage fluid, postbronchoscopy sputum and biopsy material have all been used to a definitive diagnosis for pulmonary tuberculosis. Hence, a prospective study was commenced to evaluate the diagnostic yield of fiberoptic bronchoscopy in sputum smear negative under RNTCP and radiologically suspected cases of pulmonary tuberculosis.

## MATERIAL AND METHODS

43 patients were enrolled in the present study at Department of Tuberculosis and Chest Diseases, RNT Medical College, Udaipur from 1<sup>st</sup> July, 2005 to 7<sup>th</sup> July, 2006.

The patients whose three sputum smear for Acid Fast Bacilli was negative under RNTCP and chest X-ray suggestive of pulmonary tuberculosis were included into the study.

Patient's history, observations on physical examination and relevant investigations were noted.

Fiberoptic bronchoscopy was carried out using either an Olympus OF2T10 bronchoscope.

Following examinations were applied on the obtained specimens:

- AFB smear examinations were done in bronchial aspirate and post bronchoscopic sputum at TB and Chest Hospital, Bari, Udaipur.
- AFB culture of bronchial aspirate done at department of microbiology, RNT Medical College Udaipur.
- Cytology of Bronchial aspirate/washing and bronchial brushing, and histopathologic examination of bronchial

biopsy done at Department of Pathology, RNT Medical College, Udaipur.

Reports were obtained and analyzed accordingly.

## RESULTS

The mean age of subjects was  $43.76 \pm 15.43$  years. There were 33 male and 10 female patients in the study group. 60 % of total patients under study were non-vegetarian and 39 % were vegetarian.

28% patients were alcoholic and 72 % patients were non-alcoholic. All of 10 females were non-alcoholic. Thus the alcoholic habit was also far more in males as compared to females.

Mean duration of illness of newly diagnosed tuberculosis patients was 6.5 months. Above table shows the cough was the single most common presenting symptom (100%) followed by expectoration (86.04%), fever (55.81%), breathlessness (55.81%), chest pain (55%) and haemoptysis (39.53%) and constitutional symptoms such as decreased appetite (65%), weakness, bodyache, malaise, etc also observed.

Table no. 2 showing that bronchoscopically normal tracheobronchial tree was observed in 25% cases, whereas congestion/erythema in 32.55 % of cases, Unhealthy mucosa/granuloma in 27.9, Cheesy secretion and necrotic material and, Bleeding from bronchus was found in 6.9 % cases. Muco-purulent secretion from bronchus in 37.2%, growth seen in 5% and external compression in 4% of the patients.

Table no. 3 shows diagnostic yield of fiber optic bronchoscopy for tuberculosis in new fresh cases. Positive early diagnosis was done in 5 cases (11.6%) whereas, overall yield for AFB

after bronchial aspirate culture was 8 out of 43 patients (18.6%).

**Table 1. Patient characteristics**

Patient characteristic	%	N=43
<b>Sex</b>		
Male	76.7	33
Female	23.2	10
<b>Mean age (years)</b>		
<b>Total</b>	43.76 ± 15.43	
Male	43.48 ± 14.42	
Female	44.7 ± 19.25	
<b>Mean duration of illness</b>	6.5 months	
<b>Symptoms</b>		
Cough	100	43
Expectoration	86.04	37
Fever	55.81	24
Decrease appetite	65.11	28
Dyspnea	55.81	24
Hemoptysis	39.53	17
Chest pain	53.48	23
Other constitutional symptoms	51.16	22

**Table 2. Bronchoscopy findings in 43 suspected cases of pulmonary tuberculosis**

Normal appearance	11
<b>Abnormalities seen* :</b>	
Muco-purulent secretion from bronchus	16
Unhealthy mucosa/granuloma	12
cheesy secretion and Necrotic material	3
Congestion	14
Bleeding from bronchus	3

\* Multiple findings in some cases

**Table-3: Diagnostic yield of fiber optic bronchoscopy for tuberculosis in fresh cases (n=43)**

Bronchoscopic method	Positive results		Exclusive positive specimen	
	No.	%	No.	%
Bronchial aspirate/Washing smear	5/43	11.6	1	2.3
Bronchial biopsy (HPE)	0/1	0.0	0	0.0
PBS for AFB smear	3/42	7.1	--	--
Positive early diagnosis	5/43	11.6	--	--
Bronchial aspirate AFB culture	6/34	17.65	3	8.82



After culture reports overall yield for tuberculosis	8/43	18.6	--	--
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## DISCUSSION

The respiratory physicians have is the problem in the diagnosis of tuberculosis patients with suspected radiography and negative sputum smear. (11) Culture results in these patients wait leads to a delay in treatment and on the other hand, empirical treatment initiation in patients load can bring unnecessary treatment, especially in terms of endobronchial tuberculosis. Baran and colleagues alike studies, TB Bronchoscopy in intrathoracic lymphadenopathy, is an important diagnostic tool and other invasive procedures to be considered before was emphasized .(12) The present study was carried out on 43 sputum smear negative for AFB under RNTCP and radiologically suspected new cases of pulmonary tuberculosis, to evaluate diagnostic yield of fiber optic bronchoscopy.

There were 33 males and 10 females with age ranging from 16 years to 75 years. Majority of the patients i.e. 93 % were having duration of illness from 1 month to 12 months. All of the patients (100 %) had low body mass index (BMI). By clinical presentation, cough (100%) was the most common presenting feature, followed by expectoration (86.04%), Decrease appetite (65.11), breathlessness (55.81%), and haemoptysis (39.53%). The constitutional symptoms including fever (55.81%) with evening rise of temperature, decreased appetite (65.11 %) were also present. The physical findings such as pallor (53.4 %), clubbing

(41.18%), lymphadenopathy (6.9%) etc. were also observed. Clinical findings in the present study were consistent with clinical features described by Bachh AA in Tuberculosis. (13) Similar clinical findings were also reported by Holmes P and Faulks L.(14)

Bronchoscopically normal tracheobronchial tree was observed in 25% cases, whereas congestion/erythema in 32.55 % of cases, Unhealthy mucosa/granuloma in 27.9, Cheesy secretion and necrotic material and, Bleeding from bronchus was found in 6.9 % cases. Muco-purulent secretion from bronchus was in 37.2%, growth seen in 5% and external compression in 4% of the patients.

Similarly, Purohit SD et al (1983) reported generalized congestion/hyperemia in most of the patients. (15) Wallace JM et al (1981) reported congestion of mucosa in 86% with no significant correlation of endoscopic findings with mycobacterial positivity. (16)

Purohit SD et al (1983) has aslo reported frothy secretions in 60% in the tracheobronchial tree while in the present study mucoid-mucopurulent secretions found in 68% (44/60).(15)

Early positive diagnostic yield for tuberculosis was 11.6% (5/43) and after culture results, overall diagnostic yield was 18.6% (8/43) amongst the patients in whom there was no history of anti-tuberculous treatment.

The smear results (11.6 %)of bronchial aspirate were comparable with the study of Wallace et al (1981), who reported it as 13% but lower than the studies of Sarkar et al (1980) and

So et al (1982) who reported it as 67% and 38% respectively.(16,17,18)

In the present study, the bronchial aspirate culture yield for mycobacterium tuberculosis was 17.65% (6/34) which was higher than that of Wallace et al (1981)who reported it as 4%.(16)

Positive post bronchoscopic sputum smear results for AFB were also lower than other studies of Purohit et al and Danek and Bower (1979) who observed it as 42% and 21% respectively.(15,19)

In the present study results of histopathological examination of bronchial biopsies for tuberculosis were not significant. But other studies reported by Wallace et al (1981),So et al (1982) and Danek and Bower (1979), were very high as it at 30% , 58% and 27% respectively. It may be possibly because they did retrospective analysis of only the proven cases and we analyze the new unidentified cases. (16,18,19)

In the present study no major complication or mortality was observed, only minor complications were observed in 6 patients (sinus tachycardia-1, respiratory distress-1, transient bleeding-2 and cough-2) for which no active management was required. Whereas Purohit et al (1983) reported sinus tachycardia as minor complication. (15) Contrary to the present study Pereira W et al (1978) observed major complications in 1.7% of the procedures with one death yielding a mortality 0.1%, however reporting minor complications including vasovagal reactions, fever, cardiac arrhythmias, bleeding, obstruction of airway, nausea, vomiting, pneumothorax, psychotic reactions and apnoea occurred in 6.5% of the procedures.(20)

Non-tuberculous conditions were diagnosed by bronchoscopic method in 32 % (14/43) of the patients during the present study. Out of these malignancy was diagnosed in 1( 2.3% ) patient showing bronchogenic carcinoma coexisting with pulmonary tuberculosis and suppurative lung disease in 4 patients (9.3%). This value should be included when considering overall diagnostic utility of bronchoscopy and related procedures. 9 other patients were diagnosed with different respiratory disorders like ILD, Bronchitis, Pneumonia, Acute Bronchitis, Pneumonitis, Bronchiectasis, COPD.

These results are also useful for making decision regarding management. Bronchoscopy is needed in this group of patients because a delay in diagnosis by trying anti-tuberculosis treatment may result in poor prognosis.

## CONCLUSION

In conclusion, our study suggests that fibre-optic bronchoscopy can provide excellent material for diagnosis of suspected cases of pulmonary tuberculosis when smears of expectorated sputum do not reveal mycobacteria. Fibre-optic bronchoscopy combined with transbronchial lung biopsy helps in early diagnosis of smear negative pulmonary tuberculosis and can differentiation of other disorders which clinical picture mimics tuberculosis.

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## PREVALENCE OF ERUPTION STATUS OF THIRD MOLARS IN COLLEGE STUDENTS OF BIKANER (INDIA)

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### ABSTRACT

**Background:** Generally eruption of third molars occurs between the age of 18 and 24 years with a wide variation. The prevalence rate of non-erupted third molars widely varies and it is influenced by age, sex and ethnic origin. The failure of third molar eruption is a quite common condition and the extraction of impacted third molar teeth is carried out as routine surgical procedure in dental departments. The present study was aimed to determine the number of third molars per person with their eruption status. **Material and Methods:** A sample size of 180 students between the age group 17-25 years was selected by multistage random sampling. All the participants were interviewed, examined and intra-oral X-rays of lower third molar tooth were taken. **Results:** The results showed that 3.33% of third molars are congenitally missing. Approximately 94% of the subjects had all four third molars, 2.78% had three molars, 1.11% had two third molars and 0.5% had one third molar with 1.67% having agenesis of all third molars. The third molar agenesis showed predilection for maxilla (4.72%) than mandible (1.94%). Sex, religion and socio-economic status had no effect on the eruption of third molar teeth. **Conclusion:** The present study showed that 33.62% of third molars were fully erupted, 40.09% partially erupted and 26.29% were remained unerupted. About 3.33% third molars were congenitally missing.

**Key words:** Third molar, tooth eruption, prevalence.

### INTRODUCTION

There are wide racial variations in the eruption sequence of third molars, although in all races these are the last teeth to erupt. The third molars are the most frequently impacted teeth because this late eruption is responsible for impaction of the third molar tooth. Different races and population groups exhibit definite inheritance

patterns of jaw size, tooth size and facial growth and this racial variation in jaw size, tooth size and facial growth is crucial for determination of the eruption, impaction and incidence of agenesis of third molars. **(1)** An unerupted or partially erupted tooth can cause mild to severe symptoms. Patients, who have unerupted tooth seek dental treatment because of pain or swelling

or other reasons. The literature shows that tooth impaction is a usual phenomenon. However, different regions of the jaw show considerable variation in the prevalence and distribution of impacted third molars. (2)

Many studies carried out on third molars, especially mandibular third molars, because of their highest incidence of retention. Mandibular third molars are more frequently associated with pathologies, their position variations are more and challenges of surgical treatment are higher. (3)

Till date, very few studies regarding eruption status of third molar teeth in Rajasthan was conducted. So, present study was aimed to determine number of third molars per person with their eruption status.

## MATERIALS AND METHODS

It was a descriptive cross-sectional study carried out among 180 subjects (90 boys and 90 girls) aged between 17 to 25 years from randomly selected three colleges of Bikaner city. 9 groups were made according to age (in completed years) with class interval of one year. Then 20 students (10 boys and 10 girls) were selected randomly for each group. The purpose of study was explained to each participant and informed consent was taken. Only those students who had full complement of teeth and had exact date of birth were included. Those participants who did not give consent and had history of extraction of any of the teeth were not included in the study.

The personal information of the subjects like name, age, sex, caste, religion and socio-economic status were recorded in a pre-tested

pre-structured performa. Clinical examination was done to see the status of third molar and based upon the status they were classified as completely erupted, partially erupted and unerupted. The eruption status was assessed by using visual method and with the aid of mirror and probe. The teeth which were partially erupted and unerupted were subjected for radiographic examination. The intra-oral peripheral X-rays of subjects were taken.

### **An unerupted tooth:**

An unerupted tooth is a tooth lying within the jaws, entirely covered by soft tissue, and partially or completely covered by bone. (4)

### **A partially erupted tooth:**

A partially erupted tooth is a tooth that has failed to erupt fully into a normal position. The term implies that the tooth is partly visible or in communication with the oral cavity. (4)

### **An impacted tooth:**

An impacted tooth is a tooth which is prevented from completely erupting into a normal functional position. This may be due to lack of space, obstruction by another tooth, or an abnormal eruption path. (4)

### **Socio- Economic Status:**

The socio-economic status of the individual or community is an important determinant of the standard of living and health status. The SES influences on the incidence and prevalence rates of many health-related events. (5)

In this study, social classes were determined using modified B. G. Prasad's classification. The Prasad's classification was taken because it is simple and only one variable (income) is used in this. This classification can be used in both rural and urban areas to assess the socioeconomic status of the community. (6)

Socio Economic Status: Class	Modified B. G. Prasad's Classification (for 2013)
I	Rs. 5156 & above
II	Rs. 2578-5155
III	Rs. 1547-2577
IV	Rs. 773-1546
V	Rs. below 773

In the present study, the classification was little modified. Class-I was considered as upper social class, class-II and class-III were considered as middle social class while class-IV and class-V were considered as lower social class.

## RESULTS

The mean age of the study group was 21 years ( $\pm 2.58$ ). The total number of third molars found in 180 subjects was 696; out of them 343 teeth were maxillary and 353 teeth were mandibular. The proportion of third molar agenesis was around 3.33% (24 of total 720 teeth). The third molar agenesis showed predilection for maxilla (4.72%) than mandible (1.94%).

Table-1 shows 93.88% subjects had all four third molars, 2.78% had three third molars, 1.11% had two third molars and 0.5% had one third molar. Only 1.67% of the subjects had agenesis of all third molars.

**Table No-1 Showing per person number of third molars:**

Gender	No of 3 <sup>rd</sup> molar per person					Total
	0	1	2	3	4	
Boys	2	0 (0)	1	3	84	90

n (%)	(2.2 2)		(1.1 1)	(3.3 3)	(93.3 3)	(100 )
Girls	1	1	1	2	85	90
n (%)	(1.1 1)	(1.1 1)	(1.1 1)	(2.2 2)	(94.4 4)	(100 )
Total	3	1	2	5	169	180
n (%)	(1.6 7)	(0.5 5)	(1.1 1)	(2.7 8)	(93.8 8)	(100 )

**Table No-2 Showing status of eruption of maxillary and mandibular third molars:**

Status of eruption	Completely erupted n (%)	Partially erupted n (%)	Unerupted n (%)	Total n (%)
Maxillary	79 (23.03)	103 (30.03)	161 (46.94)	343 (100)
Mandibular	155 (43.91)	176 (49.86)	22 (6.23)	353 (100)
Total	234 (33.62)	279 (40.09)	183 (26.29)	696 (100)

Table-2 shows the status of eruption of maxillary and mandibular third molars in which 33.62% of teeth were completely erupted, 40.09% of them were partially erupted and 26.29% of them were unerupted. Complete eruption was found more in mandibular third molars (43.91%) as compared to maxillary third molars (23.03%); while non eruption was found more common in maxillary third molars (46.94%) as compared to mandibular third molars (6.23%).

**Table No-3 Showing significance of variables of third molar eruption:**

Variable	Completely erupted n (%)	Partially erupted n (%)	Un erupted n (%)	Chi square (df)	P Value
<b>Sex</b>					
<b>Boys</b>	115 (33.14)	152 (43.80)	80 (23.05)	5.19 4 (2)	0.07 4
<b>Girls</b>	119 (34.10)	127 (36.39)	103 (29.51)		
<b>Religion</b>					
<b>Hindu</b>	154 (34.00)	175 (38.63)	124 (27.37)	1.31 5 (2)	0.51 8
<b>Muslim</b>	80 (32.92)	104 (42.80)	59 (24.28)		
<b>Social class</b>					
<b>Upper</b>	43 (34.4)	44 (35.2)	38 (30.4)	2.12 6 (4)	0.71 3
<b>Middle</b>	122 (32.8)	155 (41.67)	95 (25.54)		
<b>Lower</b>	69 (34.67)	80 (40.20)	50 (25.13)		

Table-3 shows that various confounding factors like sex, religion and socio-economic status did not associated with eruption of maxillary and mandibular third molars ( $P > 0.05$ ).

## DISCUSSION

The mean age of this study group was 21 years ( $\pm 2.58$  SD). Sandhu *et al.* (3) reported a mean age of their subjects as 19.3 years. Byahatti S *et al.* (1, 2) reported a mean age of their

subjects 21.58 years ( $\pm 2.9079$ ) and 23.5 years ( $\pm 2.9079$ ) in two studies conducted in Libiya and South India respectively.

In present study, about 33.62 % of the third molars were found to be completely erupted and remaining 66.38% of the teeth were in various stages of eruption. Almost same results were found in Byahatti S *et al.*'s (1) study while in Sandhu *et al.*'s (3) study, 24% of the teeth were found to be erupted and 76% were in various stages of eruption.

The proportion of students having all 4 third molars was higher (93.88%) than a study by Sandhu *et al.*(3) (76%) but lower than Byahatti S *et al.*'s (2) (94.66%) in Indian population.

In present study the incidence of congenitally missing third molars was found 3.33% which is lower than the data reported by Sandhu *et al.*(3) (11.5%), Levesque *et al.* (7) for French Canadians (9%), Hattab *et al.* (8) for Jordanians (9.1%), Venta *et al.* (9) for Finnish students (12%).

In the present study conducted on college students of Bikaner city (India), 1.67% had agenesis of all third molars, which is almost similar than the results obtained from Hattab *et al.* (8) (1.7%) and Hugoson and Kugelberg,(10) on Swedish population (2%); but slightly less than results by Byahatti S *et al.* (1,2) (2.5% for Libyan population and 3.33% for South Indian population).

The proportion of agenesis of third molars in boys (2.22%) was higher than girls (1.11%) findings were similar to the findings of Levesque *et al.* (7) and Hattab *et al.* (8) but differ



from those of Sandhu *et al.* (3) and Shah *et al.* (11).

The results show that maxillary agenesis (4.72%) was more common than the mandibular (1.94%), which is similar with the results of previous studies. (3, 8)

Observations of present study showed that more than three quarters of the subjects had all four third molars, which was similar to the results obtained by Hattab *et al.* (8) and Sandhu *et al.*(3). But this proportion was higher compared with the findings of Hellman (12) on American students, who noted that one half of the persons had all four third molars.

Results showed no significant differences in eruption status of third molars among boys and girls, (P value = 0.074), which was in agreement with the results obtained from Hattab *et al.* (8) but differ from Hellman (12).

Study shows that maxilla had a higher frequency of unerupted teeth (46.94%) than the mandible (6.23%). 33.62% of third molars were fully erupted, this value is close to Venta *et al.* (9) ((35%) but more than that reported by Sandhu *et al.* (3) (24%) and less than that reported by Hattab *et al.* (8) (58%).

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## COMPARATIVE STUDY OF EVACUATION OF CHRONIC SUBDURAL HAEMATOMA BY TWO BURR HOLE TECHNIQUE VERSUS SINGLE BURR HOLE WITH PARTIAL EXCISION OF MEMBRANE TECHNIQUE

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### ABSTRACT:

**OBJECTIVES:** Present study was planned to compare the postoperative outcome of surgical evacuation of chronic subdural haematoma (SDH) through two burr hole technique versus single burr hole with partial excision of membrane technique. **METHODS:** All patients admitted in neurosurgery ward of Geetanjali Medical College and Hospital, Udaipur were evaluated by taking detailed history, clinical examination and investigations. After confirmation of chronic SDH by CT/MRI scan patients were operated. Initial 50 patient were operated by two burr hole technique and last 50 patient were operated by using single burr hole with parted excision of membrane technique. **RESULTS:** 50 patients were operated by Two Burr Hole technique and the duration of operation ranged from 15 to 40 min. Most of the symptoms relieved postoperatively within 6 hours to 6 days. Hospital stay found with average of 6.5 days. During follow-up 3 patients showed recurrence. The results after 3 months follow up were excellent in 86 %. 50 patients were treated with Single burr hole with partial excision of membrane technique. The duration of operation ranged from 10-30 minutes. Most of the symptoms relieved within 6 hours to 6 days. Hospital stay of patients was with average of 5 days. Two patients, showed re-accumulation of chronic SDH during follow up. The results after 3 months follow up were excellent in 90 %. **CONCLUSIONS:** With this study, we have reached to the conclusion that single burr hole evacuation of chronic SDH with partial excision of membrane technique is simple, safe, less time consuming and effective treatment of chronic SDH.

**Keywords:** Chronic subdural haematoma, two burr hole technique , single burr hole technique.

### INTRODUCTION

Chronic subdural haematoma (Ch. SDH) is a well-known entity and common surgical disorder managed by neurosurgeon and if not recognized and treated timely, may prove fatal. It can be

non traumatic or post traumatic and all of them need urgent attention irrespective of etiology. (1) It manifest with progressive neurologic deficit that occur later than 2 weeks following head

injury.(2) Besides clinical suspicion various modalities has been used to diagnose Ch. SDH but CT scan of head is the investigation of choice. CT scan has changed the ways in which patients with Ch. SDH may best be managed. (3) Some Ch. SDH will resolve spontaneously as suggested by the existence of calcified "haematomas". Medical management has been advocated for the patient with Ch. SDH included bed rest, steroids and mannitol but it needs prolonged hospitalization for these patients. (4) It would appear that operative treatment would be more quickly, safely and effectively remove the mass. (5) Most current authors prefer to place two or three burr holes on the side of lesion and to irrigate through small red rubber catheters to wash out the subdural space with or without use of sterile closed drainage system.(6)

Few authors have suggested the use of a single burr hole and thorough irrigation for evacuation of Ch. SDH. Instead of evacuation through a burr hole, evacuation through a twist drill hole was found to be equally satisfactory by some surgeons.(7) Evacuation of Ch. SDH by craniotomy is also indicated in certain situations and there are few surgeons who feel craniotomy has still a definite role in management of Ch. SDH. Endoscopic evacuation of Ch.SDH can also be done.(8)

In the light of current knowledge, there are various methods for surgical evacuation of Ch. SDH. Described by different authors, all the methods have its merits and demerits. Debate is still on that which is the best method. This study is planned to compare the postoperative outcome of evacuation of Ch. SDH by two different techniques in the same set up.

## MATERIAL AND METHODS:

All patients admitted in neurosurgery ward of Geetanjali Medical College and Hospital, Udaipur were evaluated by taking detailed history, clinical examination and investigations. Diagnosis of Ch. SDH was confirmed by CT scan or MRI scan head. Incidence of the Ch. SDH was recorded out of all admitted patients in a particular time period. After confirmation of Ch. SDH by CT/MRI scan patients were operated. Initial 50 patient were operated by two burr hole technique and last 50 patient were operated by using single burr hole with parted excision of membrane technique. Case selection for operation- This study Includes:-

- CT/MRI proved symptomatic cases of Ch. SDH.
- Patients of both sex and all age groups (except children less than 5 years) irrespective of etiology.
- All the patients were operated for the first time for the disease (Ch. SDH).

### Exclusion Criteria:-

This study excludes:-

- Children less than 5 years.
- Patients with recurrent disease after previous operation.
- Asymptomatic patients with very thin Ch. SDH

Operations by "Two burr hole technique" and "Single burr hole with partial excision of membrane technique" were done under local anesthesia with or without IV sedition as emergency basis. After achieving proper homeostasis scalp stitched in layers. Duration of surgery was noted.

### **Postoperative Management:-**

Careful record of postoperative progress was kept in both of the groups as per standard format along with any postoperative complication. Early mobilization of patient was encouraged postoperatively. Patients were discharged at appropriate time and advised for regular follow up. Total duration of hospital stay and the mortality was noted. Follow up of the patients done for three months.

### **RESULTS:**

The study was done on 100 patients of Ch. SDH admitted in neurosurgery ward during year 2000-2003. Out of these 100 patients most of the patients belonged to 6<sup>th</sup> and 7<sup>th</sup> decade of life. 17 % of Patients were in 8<sup>th</sup> decade of life and ranged from 8 to 92 years,

20 % of the patients were female as compared to 80 % males. 60 % of patients were from urban population while 40 % patients were rural. The cause of urban preponderance is probably easy availability of CT scan and early approach to doctor in urban areas. Most of the patients presented with headache followed by weakness and paralysis, irrelevant talk, mental slowing fluctuating drowsiness etc. Eight of our patients presented with COMA. Previous head injury was found to be most common etiology in 68 patients.

### **Two Burr Hole technique :**

50 patients were operated by this technique the duration of operation ranged from 15 to 40 min average of 30 min. 43 patients showed dramatic relief in symptoms postoperatively and most of the symptoms relieved within 6 hours to 6 days.

Early mobilization of patients was encouraged in 3 patients showed partial improvement and 4 did not show any improvement. Hospital stay ranged from 2 to 24 days with average of 6.5 days. Four patients died postoperatively who presented with coma and did not show any improvement postoperatively.

During follow-up 3 patients showed recurrence. Needle aspiration was done but patients repeatedly returned back even after several re-aspiration of haematoma fluid. Finally, decision of membranectomy was taken and following membranectomy no any patient showed recurrence.

The results after 3 months follow up was excellent in 86 % in which, most of the symptoms relieved and patient showed no recurrence ,fair 6% in which patients showed recurrence and 8 % poor in which patients did not improved and died.

### **Single burr hole with partial excision of membrane technique**

50 patients were treated with these techniques. The duration of operation ranged from 10-30 minutes, with average of 20 minutes. 45 patients showed dramatic improvement and most of the symptoms relieved within 6 hours to 6 days. Early mobilization was encouraged. 2 patients showed partial improvement and 3 patients did not show any improvement in symptoms.

Hospital stay of patients was ranged from 1 to 23 days with average of 5 days. Three patients died postoperatively; 2 of them were those who presented in deep coma with a prolonged history and found to have re-bleed following membranectomy. During follow up two patients

showed re-accumulation of Ch. SDH, which were treated by needle aspiration of haematoma fluid and later cured.

The result after 3 months follow up was excellent in 90 % in which most of the symptoms were relieved and no recurrence was seen. Fair in 4 % in which recurrence was seen and later relieved by re-aspiration of haematoma. Poor 6 % in which patient did not show any improvement and died Delayed recovery was seen Post-operatively in few patients due to trapping of air in frontal region causing delayed recovery.

## DISCUSSION:

This study was designed to compare the operative and postoperative results of surgical evacuation of Ch. SDH by two burr hole technique versus single burr hole and partial excision of membrane technique and to know the incidence of disease among the patients admitted in Neurosurgery Ward.

100 patients were included in this study and most of the patient belonged to 6<sup>th</sup> and 7<sup>th</sup> decade of life, the mean age 57.86 years and ranged from 8 to 92 years. Kim G H et al found mean patient age 68.6 years (range, 31–94) (9) The higher incidence among the older age group is because of cerebral atrophy and slow accumulation of blood.

All authors ascertain the predominance of male patients in their series. Young-Joon Rho et al and Shameem A et al also found a predominance of male patient, 2.9 and 7.5 respectively to every female patient in Ch. SDH. (10,11) In our study, there were 80 % males as compare to 20 % Females. Cause of male preponderance could be

because they are more prone to injuries because of more outing.

Okada Y. et al reported average postoperative hospital stay of 14.1 days by Burr hole and closed drainage system group and 25.5 days in Burr hole irrigation group. In our study, postoperative hospital stay was 5 days in single burr hole with partial excision of membrane technique and 6.5 days in Two burr hole technique. (12)

Different authors observed different rate of recurrence by different techniques. Nayil K et al treated 254 Patients with single and double-burr-hole technique and found recurrence rate of 6.15% and 4.83% respectively, which was not statistically significant.(13) Kansal R did a retrospective study of 267 patients with chronic subdural hematomas and the patients managed surgically by either single or double burr. Recurrence rates of both techniques were not significantly different. (14) Kutty SA et al shows recurrence rate of 15.7%, two burr holes technique and in a single burr hole craniostomy 2.8 % recurrence rate was seen. The difference was statistically significant.(15) Kuroki T et al (2001 ) noted recurrence in 1.8% in strict closed system drainage group versus 11.1% in closed system drainage with irrigation group.(16) In our study recurrence rate was 6% in two burr hole technique and 4 % in single burr hole with partial excision of membrane technique.

A meta-analysis by Weigel et al observed no significant difference in mortality in three techniques, namely twist drill craniotomy, burr hole or craniotomy. (17) Smely et al reported 9 % mortality rate in Burr hole craniotomy and 6% in twist drill trephination technique. (18) In

our study, mortality rate was 6% in single burr hole partial excision of membrane technique and 8% in two-burr hole technique. Mortality was because of haematoma.

A retrospective study made by Benzel et al on 111 patient using single burr hole irrigation technique and postoperative outcome at 6 weeks was excellent in 90%. Fair 5.5 % and poor 4.5 %.(19) In our study, the post of outcome after 3 months was excellent 90%o fair 4 % and poor 6 % in single burr hole and partial excision of membrane technique and excellent 86%, fair 6%, and poor 8% in two burr hole technique.

#### CONCLUSION:

With this study, we have reached to the conclusion that single burr hole evacuation of Ch. SDH with partial excision of membrane technique is simple, safe, less time consuming and effective treatment of Ch SDH. Only one burr hole is required in this technique postoperative hospital stay is less and less re-accumulation of blood as well as number of aspiration with this technique, of course partial excision of membrane helps in it.

Other significant factors in the study were early mobilization of patient and no drain was used which most of authors recommend. Because of this reasons we have shifted from two-burr hole technique to single burr hole with partial excision of membrane technique.

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