

# PREVALANCE OF HYPONATREMIA IN MICROBIOLOGICALLY CONFIRMED PULMONARY TUBERCULOSIS PATIENT IN TERTIARY CARE HOSPITAL

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## **INTRODUCTION:**

Tuberculosis (TB) is caused by Mycobacterium Tuberculosis that most often affects the lungs. India is the highest TB burden country - an estimated incidence of 26.9 lakh cases in 2019. Hyponatremia is one of the most common and important electrolyte abnormalities in clinical practice. Hyponatremia is defined as serum sodium less than 135 mmol/litre, Mild hyponatremia is serum sodium concentration between 130 and 135 mmol/moderate hyponatremia is between 125 and 129 mmol/l and Severe hyponatremia is less than 125 mmol/l respectively. Early detection and treatment of underlying hyponatremia can potentially reduce mortality and morbidity associated with tuberculosis and shorten the duration of hospital stay. Adrenal TB is one of the causes of hyponatremia which can lead to death in few cases if not treated properly so has to be identified earlier.

## **MATERIAL AND METHODS:**

This study was conducted in patients diagnosed with Pulmonary Tuberculosis at Department of Pulmonary medicine. It was a Retrospective study. Patients treated

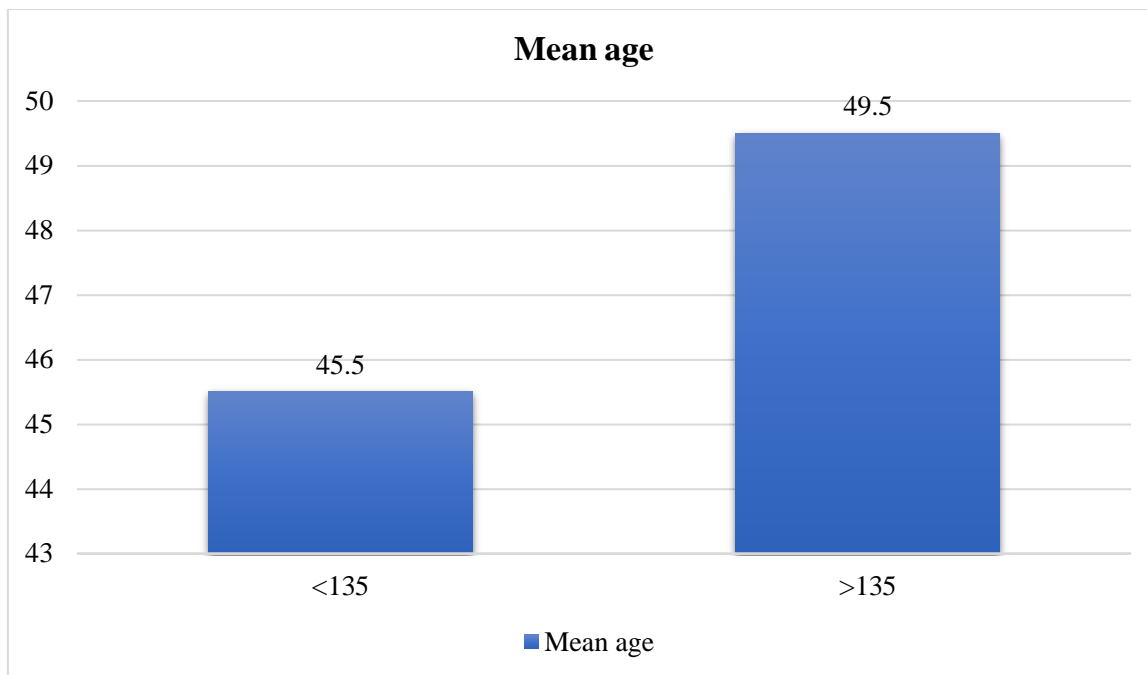
as microbiologically confirmed PTB from June 2021 to June 2022 were included in the study. It was a retrospective study in 122 patients. Inclusion criteria are microbiologically confirmed Pulmonary Tuberculosis cases that were admitted in the hospital. Exclusion criteria: Pregnancy, Kidney disease, Patients on diuretics and medicines related to SIADH, DRTB

## **RESULTS:**

A total of 122 microbiologically confirmed tuberculosis patients were included in the study the mean age of the population was 47.13±13.83. With 66 (54%) male and 56(46%) female.73 (59.8%) patients out of 122 patients had hyponatremia. The mean age was 45.5±13.6 in patients with hyponatremia and the mean age was 49.95±13.73 in patients with normal sodium levels. The difference in the age was not statistically significant with a p value of 0.08.

The mean weight of the patients was 54kgs with a standard deviation of 10.33kgs.the correlation between weight and serum sodium levels was calculated but that was not statistically significant.

Serum sodium levels	Mean age
<135	45.5
>135	49.5
P	0.08

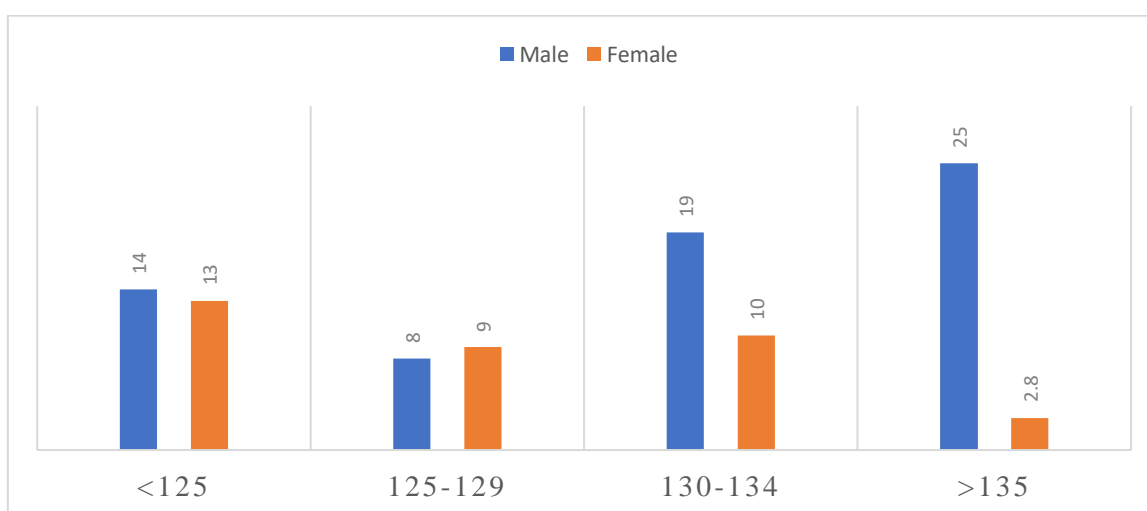


Sex	Mean Serum sodium
M(66)	132.36
F(56)	133.3
P	0.63

The mean sodium levels were  $132.36 \pm 10.2$  in males and  $133.3 \pm 11.5$  in females the p value was 0.6 which was statistically no significant. The age and sodium levels had no significant correlation with a spearman's rho value of 0.10. As shown in the table 27(22%)

patients out of 122 were having severe hyponatremia. 17 (13.9%) patients had moderate hyponatremia and 29(23.7%) patients had mild hyponatremia.

SODIUM LEVELS(MG/DL)		M	F
<125	27	14	13
125-129	17	8	9
130-134	29	19	10
>135	49	25	24



Duration of symptoms was seen as acute within 2 weeks or chronic more than 2 weeks. Less than 2 weeks in 65 patients and more than 2 weeks in 57 patients.

DURATION OF SYMPTOMS	HYPONATEMIA	NORMAL
<2 WEEKS	34	31
>2 WEEKS	39	18

The above table shows the distribution of acute and chronic symptomatic patients in hyponatremia group and normal group the p value is 0.070 which is not statistically significant. Patients with severe hyponatremia all had symptoms of like Headache, low blood pressure, muscle cramps and twitching. Patients with mild hyponatremia showed no symptoms specific to hyponatremia. 50% of patients with moderate hyponatremia showed symptoms like headache and muscle cramps. 24(19.6%) patients out of 122 had smear negative for AFB but CBNAAT positive sputum negative patients. The mean sodium levels in sputum negative patients was  $132\pm 9.2$  and  $132.87\pm 11.2$  in smear positive patients the mean difference was not statistically significant. The mean duration of hospital stay was  $6\pm 2.8$  days. In patients with hyponatremia it was  $7\pm 3$  days and in patients with normal sodium levels the mean hospital stay was  $4.9\pm 1.1$  days. Spearman's rho correlation was done between sodium levels and duration of hospital stay it was -0.49 with a p value of  $<0.00001$  which was statistically significant

**DISCUSSION:**

Hyponatremia is commonly caused due to fluid overload as result of inability to excrete water taken orally or intravenously. The two main causes of hyponatremia are inappropriate ADH secretion and non-osmotic release of ADH due to volume depletion.<sup>1</sup> SIADH diagnosis is established by the exclusion of other causes of hyponatremia. Many causes of SIADH have been reported like malignancies (Pulmonary, mediastinal, extra thoracic), drugs, central nervous system disorders (trauma, stroke, demyelinating or inflammatory diseases) and pulmonary disorders (acute respiratory failure, infections). Tuberculosis one of the commonest diseases in developing countries can cause hyponatremia by various mechanisms like tubercular meningitis, local invasion of hypothalamus or pituitary and ADH secretion via pulmonary infection. Various mechanisms have been postulated but the mechanism of SIADH associated with pulmonary infection is still poorly understood.<sup>2</sup> A total of 122 patients were included in the study with a mean age of  $47.13\pm 13.83$ . the age range was between 24 years and 80 years. Male predominance was seen in the study population with 54%. Out of 122 patients

73(59.8%) patients had hyponatremia. A study done by Shwetha MS et al reported hyponatremia in 76% of patients.<sup>3</sup> Another study done by Bokam et al showed similar results to our study with 61% of patients having hyponatremia.<sup>4</sup> The mean age in patients with hyponatremia was 45. there was no correlation of sodium levels with age in a study done by Khan et al patients with advancing age showed lower levels of sodium which was not the case in our study. The mean sodium levels in males were 132.6 and females was 133.3 the difference was not statistically significant. Khan et al reported males to have higher sodium levels.<sup>5</sup> In our study 39% pts had mild hyponatremia and 36% had severe hyponatremia. The results were similar to the study of Shwetha MS et al who observed 39% patients with mild hyponatremia. All our patients had normal renal function parameters and normal USG abdomen after ruling out all the causes the reason for hyponatremia was diagnosed to be ADH secretion due to pulmonary infection. Patients with hyponatremia had a longer duration of hospital stay when compared to patients with normal sodium levels. There was a negative correlation which was statistically significant between sodium levels and duration of hospital stay. Which means the duration of hospital stay increases with low levels of sodium. These findings were similar to the study of Mark a challan et al who reported that hyponatremia significantly increase the length of hospital stay and increases the economic burden.<sup>6</sup>

**CONCLUSION:**

We suggest a routine screening of sodium levels in all patients with pulmonary tuberculosis as there is increased prevalence and there was no positive correlation with age and gender. Hyponatremia increase the hospital stay and early correction cuts the duration of hospital stay and decreases of economic burden.

**REFERENCES:**

1. Jonaidi Jafari N, Izadi M, Sarrafzadeh F, Heidari A, Ranjbar R, Saburi A. Hyponatremia due to pulmonary tuberculosis: review of 200 cases. Nephrourol Mon. 2013 Winter;5(1):687-91.

2. Lee P, Ho KK. Hyponatremia in pulmonary TB: evidence of ectopic antidiuretic hormone production. *Chest*. 2010 Jan;137(1):207-8. doi: 10.1378/chest.09-0405. PMID: 20051406.
3. Shwetha MS, Munavalli VP. Prevalence of hyponatremia in adult patients with pulmonary tuberculosis. *Indian J Immunol Respir Med* 2019;4(1):4-7
4. Bokam BR, Badikillaya VU. Prevalence of hyponatremia in pulmonary tuberculosis - A pilot study from a tertiary care center in south India. *Int J Med Sci Public Health* 2017;6(1):75-79.
5. Khan K, Rasool N, Mustafa F, Tariq R. Hyponatremia Due to Pulmonary Tuberculosis in Indian Population. *Int J Sci Stud* 2017;5(5):98-101
6. Callahan MA, Do HT, Caplan DW, Yoon-Flannery K. Economic impact of hyponatremia in hospitalized patients: a retrospective cohort study. *Postgrad Med*. 2009 Mar;121(2):186-91.