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Evaluation of Erythrocyte Sedimentation Rate in Tuberculosis Patients Attending University Teaching Hospital Sagamu Ogun State

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ABSTRACT

The erythrocyte sedimentation rate (ESR) is a common laboratory measurement as an indicator for systemic inflammation, HIV, cancer, and clinical pathologies which infection is among in clinical investigation. This present study evaluated the erythrocyte sedimentation rate among tuberculosis patients attending Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun state. Blood samples were collected directly into the ESR tube (Westergren Method) and read after one hour. The results showed that tuberculosis patients had higher erythrocyte sedimentation rates higher than the normal reference value for both males and females ((56 mm/hr in males and 34 mm/hr in females). It is therefore recommended that more funds should be raised or donated to the anti-tuberculosis campaign programme. The infected patient should be given more orientation about disposing of the sputum in other not to spread the disease to others in the community.

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INTRODUCTION

Tuberculosis (TB) one of the earliest known diseases and still a major cause of mortality even today, has many manifestations affecting the blood, bone, central nervous system and many other organ systems but it is primarily a pulmonary disease¹. These organisms include *M. tuberculosis*, *M. bovis*, *M. africanum*, *M. microfti* and *M. canetti*². Tuberculosis is a gradually progressive debilitating disease, it is a necrotizing bacterial infection with protein manifestations and wide distribution. It is an indicator of social organization & standard of living in the community³. The Erythrocyte Sedimentation Rate (ESR) measures the rate of fall of red blood cells in a vertical column of anticoagulated blood in 1 hour, and the units expressed in millimetres per hour⁴. Erythrocyte Sedimentation Rate (ESR) is an inexpensive, easily available investigation particularly in resource-poor countries, such as Nigeria, where tuberculosis (TB) is common. The Erythrocyte Sedimentation Rate (ESR) is commonly done as a non-specific test during the primary diagnostic workup for tuberculosis, a chronic bacterial infection⁵. This study is to evaluate the erythrocyte sedimentation rate among tuberculosis patients attending Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun state, Nigeria.

METHODS

Study area

The research work was carried out at Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun state, Nigeria.

Study population

The study population is made up of fifty (50) tuberculosis patients attending Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun state.

Exclusion criteria

A thorough physical examination was performed by the clinician to exclude patients with other complications.

Inclusion criteria

Tuberculosis patients attending Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun state subjects of both sexes were included.

Sample collection

Blood samples were collected following aseptic conditions, and using the Westergren method. 2.0 mL of venous blood was added into a tube containing 0.5 mL of sodium citrate. The sample tubes were placed vertically positioned in a rack for 1 hour at room temperature, after which the distance from the surface meniscus to the upper limit of the red cell sediment is measured. The distance of fall of erythrocyte expressed as millimetres in 1 hour, is the ESR.

Statistical Analysis

The results were analyzed using descriptive statistics of simple percentages and presented in form of tables.

RESULTS AND DISCUSSION

This present study assessed erythrocyte sedimentation rate in tuberculosis patient attending Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun state.

Table 3.1: Shows the Age Distribution of the Tuberculosis Patients

Age Distribution	Frequency	Percentage (%)
15 -24	05	10
25-34	15	30
35-44	21	42
45-54	09	18
Total	50	100

The age distribution showed that 5(10%) of the tuberculosis patients are within the age bracket of 15-24 yrs, 15(30%) are within the age bracket of

25-34years, 21(42%) are within the age brackets of 35-44 years and 9(18%) are within the age bracket of 45-54 years.

Table 3.2: Sex Distribution of tuberculosis Patients

Sex Distribution	Frequency	Percentage (%)
Male	39	78
Female	11	22
Total	50	100

The sex distribution showed that 39(78%) of the tuberculosis patients were male while 11(22%) were female.

Table 3.3: Shows the age distribution of the tuberculosis patients in relation to ESR value (n=50)

Age Range	Frequency	Percentage (%)	Normal value	Abnormal value
			0-15mm/hr (Male)	> 0-15mm/hr (Male)
15-24	05	10	---	(10%)
25-34	15	30	---	15(30%)
35-44	21	42	--	21(42%)
45-54	09	18	--	9(18%)
Total	50	100	--	50(100%)

References value for ESR, Male= 0-15mm/hr, Female = 0-20mm/hr (Monica, 2006)

Table 4.3 above shows the age distribution of the tuberculosis patients in relation to ESR values. Among age groups 15-24 years, normal ESR value (nil), abnormal ESR value 5(10%) . Age group 25-34 years; normal ESR value (nil),

abnormal ESR value 15(30%). Age group 35-44 years; normal ESR value (nil), abnormal ESR value 21(42%) while age group 45-54 years; normal ESR value (nil) abnormal ESR value 9(18%).

Table 3.4: Shows the gender distribution of the tuberculosis patients in relation to ESR value (n=50)

Age Range	Frequency	Percentage (%)	Normal value	Abnormal value
			0-15mm/hr (Male)	> 0-15mm/hr (Male)
			0-20mm/hr (Female)	> 0-20mm/hr (Female) (mean value)
Male	39	78	---	56 mm/hr
Female	11	22	---	36 mm/hr
Total	50	100		92 mm/hr

References value for ESR, Male= 0-15mm/hr, Female = 0-20mm/hr (Monica, 2006 pp 329-331).

Table 4.4 above shows the gender distribution of the tuberculosis patients in relation to ESR values. Among male tuberculosis patient, normal value ESR (nil), abnormal value ESR 11(22%). Among female tuberculosis patient, normal value ESR (nil), abnormal value ESR 39(78%).

disease and in infections (Tishkowski and Gupta, 2022)⁶.

This present study investigates the erythrocyte sedimentation rate among tuberculosis patients attending Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun state. Blood samples collected directly into ESR tube (Westergren Method) and read after 1hour.

DISCUSSION

The erythrocyte sedimentation rate (ESR) is common laboratory measurements of systemic

The results showed that tuberculosis patients had higher erythrocyte sedimentation rate higher than the normal reference value for both male and female ((0-15mm/hr in men and 0-20mm/hr in women). Western green method values. This study is inconsistency with the findings of [Al-Marri](#), and [Kirkpatrick](#) (2000)⁷ where out of 144

inflammation in clinical practice. This test is often used for the diagnosis and monitoring of a variety of conditions in particular rheumatic

TB patients, 68 (47%) had an elevated ESR than normal values.

The results showed that tuberculosis patients had higher erythrocyte sedimentation rates higher than the normal reference value for both males and females ((56 mm/hr in males and 34 mm/hr in females).

CONCLUSION

It can be concluded that there is significant elevation in erythrocyte sedimentation rate in tuberculosis patients attending Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun state.

REFERENCES

1. Akpan P, Patience A, Ephora A. Some haematological parameter of tuberculosis in Infected Africans: The Nigerian perspective. *J of Nat. Sci Res.* 2012; 2 (1):
2. Iseman MD (2000). *A Clinical Guide to Tuberculosis*. Philadelphia; Lipincott, Williams & Wilikins.
3. Al-Zamel F. *Detection & Diagnosis of Mycobacterium Tuberculosis*. Expert Review of Anti-infective Therapy. 2009; 7: 1099-108.
4. Getaneh, Z., Ayelgn, F., Asemahegn, G. et al. A comparison of erythrocyte sedimentation rates of bloods anticoagulated with trisodium citrate and EDTA among TB presumptive patients at the University of Gondar comprehensive specialized hospital, northwest Ethiopia. *BMC Res Notes* 13, 113 (2020). <https://doi.org/10.1186/s13104-020-04963-0>.
5. Dewi MMW, Herawati S, Mulyantari NK, Prabawa IPY. The comparison of erythrocyte sedimentation rate (ESR) modify Westergren Caretium Xc-A30 and Westergren Manual in Clinical Pathology Laboratory, Sanglah General Hospital, Denpasar, Bali. *Bali Med J.* 2019;8(2):396–9.
6. Tishkowsk K, Gupta V. (2022). Erythrocyte Sedimentation Rate. In: *StatPearls* [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK557485/>
7. Al-Marri, M. R. and Kirkpatrick, M. B., (2000). Erythrocyte sedimentation rate in childhood tuberculosis. *The International Journal of Tuberculosis and Lung Disease*, Volume 4, Number 3, pp. 237-239