ERYTHROCYTE SEDIMENTATION RATE AND ITS RELATION TO HIGH GRADE FEVER IN PATIENTS PRESENTING IN THE OUTDOOR DEPARTMENT

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ABSTRACT:
The erythrocyte sedimentation rate (ESR or sed rate) is the rate at which red blood cells in anticoagulated whole blood descend in a standardized tube over a period of one hour. It is a common hematology test, and is a non-specific measure of inflammation. This cross-sectional study was conducted among the patients presenting in the medical outdoor department of different hospitals. Name, age, gender and history of fever and ESR levels were noted on a predefined proforma. All the data was entered and analyzed with SPSS Ver. 23.0. A total of 70 patients were included in this study i.e., 35 males (50%) and 35 females (50%). The mean age of the patients was 31.23±2.45 years. Out of 70 patients, thirty patients had raised ESR levels. Out of them only sixteen had raised fever.

KEYWORD: ERYTHROCYTE SEDIMENTATION RATE
INTRODUCTION:

The erythrocyte sedimentation rate (ESR or sed rate) is the rate at which red blood cells in anticoagulated whole blood descend in a standardized tube over a period of one hour. It is a common hematology test, and is a non-specific measure of inflammation. To perform the test, anticoagulated blood is traditionally placed in an upright tube, known as a Westergren tube, and the distance which the red blood cells fall is measured and reported in mm at the end of one hour. Since the introduction of automated analyzers into the clinical laboratory, the ESR test has been automatically performed. The ESR is governed by the balance between pro-sedimentation factors, mainly fibrinogen, and those factors resisting sedimentation, namely the negative charge of the erythrocytes (zeta potential). When an inflammatory process is present, the high proportion of fibrinogen in the blood causes red blood cells to stick to each other. The red cells form stacks called rouleaux which settle faster, due to their increased density. Rouleaux formation can also occur in association with some lymphoproliferative disorders in which one or more paraproteins are secreted in high amounts. While abnormal in humans, rouleaux formation can be a normal physiological finding in horses, cats, and pigs.

The ESR is increased in inflammation, pregnancy, anemia, autoimmune disorders (such as rheumatoid arthritis and lupus), infections, some kidney diseases and some cancers (such as lymphoma and multiple myeloma). The ESR is decreased in polycythemia, hyperviscosity, sickle cell anemia, leukemia, chronic fatigue syndrome, low plasma protein (due to liver or kidney disease) and congestive heart failure. Although increases in immunoglobulins usually increase the ESR, very high levels can reduce it again due to hyperviscosity of the plasma. This is especially likely with IgM-class paraproteins, and to a lesser extent, IgA-class. The basal ESR is slightly higher in females. The rate of erythrocyte sedimentation is affected by both inflammatory and non-inflammatory conditions. In inflammatory conditions, fibrinogen, other clotting proteins, and alpha globulin are positively charged,
thus increasing the ESR. ESR begins to rise at 24 to 48 hours after the onset of acute self-limited inflammation, decreases slowly as inflammation resolves, and can take weeks to months to return to normal levels. For ESR values more than 100 mm/hour, there is a 90% probability that an underlying cause would be found upon investigation (1-3).

**MATERIAL AND METHODS:**
This cross-sectional study was conducted among the patients presenting in the medical outdoor department of different hospitals. Name, age, gender and history of fever and ESR levels were noted on a predefined proforma. All the data was entered and analyzed with SPSS Ver. 23.0. The quantitative variables were presented as mean and standard deviation. The qualitative variables were presented as frequency and percentages.

**RESULTS:**
A total of 70 patients were included in this study i.e., 35 males (50%) and 35 females (50%). The mean age of the patients was 31.23±2.45 years. Out of 70 patients, thirty patients had raised ESR levels. Out of them only sixteen had raised fever.

**DISCUSSION:**
ESR can sometimes be useful in diagnosing diseases, such as multiple myeloma, temporal arteritis, polymyalgia rheumatica, various auto-immune diseases, systemic lupus erythematosus, rheumatoid arthritis, inflammatory bowel disease and chronic kidney diseases. In many of these cases, the ESR may exceed 100 mm/hour. It is commonly used for a differential diagnosis for Kawasaki’s disease (from Takayasu’s arteritis; which would have a markedly elevated ESR) and it may be increased in some chronic infective conditions like tuberculosis and infective endocarditis. It is also elevated in subacute thyroiditis also known as DeQuervain’s. In markedly increased ESR of over 100 mm/h, infection is the most common cause (33% of cases in an American
study), followed by cancer (17%), kidney disease (17%) and noninfectious inflammatory disorders (14%). Yet, in pneumonia the ESR stays under 100. The usefulness of the ESR in current practice has been questioned by some, as it is a relatively imprecise and non-specific test compared to other available diagnostic tests.

It is a component of the PCDAI (Pediatric Crohn's Disease Activity Index), an index for assessment of the severity of inflammatory bowel disease in children. The clinical usefulness of ESR is limited to monitoring the response to therapy in certain inflammatory diseases such as temporal arteritis, polymyalgia rheumatica and rheumatoid arthritis. It can also be used as a crude measure of response in Hodgkin's lymphoma. Additionally, ESR levels are used to define one of the several possible adverse prognostic factors in the staging of Hodgkin's lymphoma (4-6).

REFERENCES:


5. Robert (Robin) Sanno Fåhræus and Alf Vilhelm Albertsson Westergren who are eponymously named for the Fåhræus-Westergren test (aka Westergren test) at Who Named It?