Letter to Editor

Micro-Erythrocyte Sedimentation Rate in Adults: A Nuanced Perspective on Utility in Emergency and Resource-constrained Clinical Settings

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Dear Sir,

Erythrocyte sedimentation rate (ESR), despite its non-specific nature as a measure of systemic inflammation, continues to be widely utilized in clinical practice with diverse applications. ESR is an effective disease monitoring tool in rheumatoid arthritis, giant cell arteritis and polymyalgia rheumatica.[1] Few researchers have shown ESR to be a promising predictive biomarker in coronary heart disease, cerebrovascular accident and prostate cancer.[2] Elevated ESR levels can offer valuable diagnostic insights across a spectrum of inflammatory and infectious disorders such as chronic obstructive pulmonary disease, acute rheumatic fever, tuberculosis, infective endocarditis, osteomyelitis, etc. and is often preferred over the more specific C-reactive protein levels merely because of its simplicity, low cost and non-necessity of additional kit/equipment.[1] However, pre-requisite of a relatively large quantity of venous blood and long test time of one hour are the major drawbacks of conventional Westergren or Wintrobe method of ESR determination. The modern day automated ESR instruments, which require less volume of blood and provide quick results, are usually not affordable and cost-effective for small-scale laboratories with lesser sample loads.

Micro-erythrocyte sedimentation rate (micro-ESR) is a modification of the conventional method wherein a capillary tube pre-treated with heparin (or a micro-hematocrit tube) is filled with capillary blood upto three-fourth of its length. After sealing one end of the tube, it is then affixed to a vertical surface (such as wall) or fixated vertically on a stand, with the sealed end facing downward. The tube is then left undisturbed for an hour, and the descent of the red cell column is recorded in millimetres to infer the micro-ESR value.[3] In contrast to conventional methods, micro-ESR obviates the need of venepuncture and requires just few drops of finger-pricked or heel-pricked capillary blood. However, the turn-around test time is more or less similar to that of conventional ESR technique. In this context, few investigators have applied the principle of micro-ESR to obtain ESR values in adult patients in lesser time and by utilizing smaller quantities of blood. Hashemi et al compared the conventional ESR values (obtained by Westergren method) and ESR values obtained by using capillary tube and capillary blood sample (micro-ESR method) and derived a formula for achieving conventional ESR value by utilizing micro-ESR value at the end of 20 minutes

(Conventional ESR values = 2.819 × micro ESR values at 20 minutes + 1.346).[4] Recently, an analogous study was performed by Chotayaporn and colleagues, who derived a similar formula by taking micro-ESR value at the end of 30 minutes (Conventional ESR values = 3.0 x Modified micro ESR values read at 30 min +1.31).[5] However, further comparative and validation studies are lacking in this direction.

The current application of micro-ESR extends only to neonatal sepsis screening and diagnosis and there is extreme paucity of literature regarding its potential role in adult patients. This underscores the need for further investigation in this domain, aiming to assess the utility of micro-ESR as a potential alternative or supplement to conventional methods in adult populations and to validate its use for broader application, which would effectively help in obtaining precise results in lesser time with reduced blood volume. This alternative micro-ESR method can be immensely useful in emergency settings where quick results are expected, for patients in whom serial ESR readings are required, patients with poor veins, etc. Resource poor laboratories that cannot afford costly automated ESR equipment can resort to micro-ESR method with no additional cost.

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References

1. Bochen K, Krasowska A, Milaniuk S, Kulczyńska M, Prystupa A, Dzida G. Erythrocyte sedimentation rate – An old marker with new applications. Journal of Pre-Clinical and Clinical Research. 2011;5(2):50-5.
2. Andresdottir MB, Sigfusson N, Sigvaldason H, Gudnason V. Erythrocyte sedimentation rate, an independent predictor of coronary heart disease in men and women: the Reykjavik Study. Am J Epidemiol. 2003;158:844–51.
3. Arun Babu T, Shankaralingappa A, Vijayadevagaran V, Sharmila V, Kalidoss VK. Comparative efficacy of micro-erythrocyte sedimentation rate (m-ESR) and C-reactive protein (CRP) as a neonatal septic screening marker-A single-center, retrospective observational study. Egypt Pediatric Association Gaz. 2023;71:32.
4. Hashemi R, Majidi A, Motamed H, Tabatabaey A. Erythrocyte sedimentation rate measurement using as a rapid alternative to the Westergren method. Emergency. 2015;3(2):50-3.
5. Chotayaporn M, Samae A, Yokart W, Panyasak D. Correlation of modified micro-ESR method with the Westergren method for the determination of erythrocyte sedimentation rate. Journal of Associated Medical Sciences. 2021;54(1):44-6.