ERYTHROCYTE SEDIMENTATION RATE DETERMINATION: APPLICATION OF VISCOELASTICITY MECHANICS IN MEDICINE

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ABSTRACT

Mechanics becomes important science at present day. It can be applied in several field including to medicine. Here, the authors discusses on the erythrocyte sedimentation rate (ESR) determination which is a basic laboratory test in medicine that is based on basic mechanics of viscoelasticity. The study on medical rheology of ESR is interesting and should be further topic for further biomechanical research.

KEYWORDS: Erythrocyte Sedimentation Rate, Viscoelasticity, Medicine, Mechanics.

INTRODUCTION

Mechanics becomes important science at present day. It can be applied in several field including to medicine. Here, the authors discusses on the erythrocyte sedimentation rate (ESR) determination which is a basic laboratory test in medicine that is based on basic mechanics of viscoelasticity. The study on medical rheology of ESR is interesting and should be further topic for further biomechanical research.

WHAT IS ERYTHROCYTE SEDIMENTATION RATE [1-2]?

ESR is the basic non specific laboratory investigation in medicine. It has been used as routine laboratory test for a very long time. The increased ESR value can be seen in several medical problems such as infection, inflammation and cancer. For the decreased ESR value, it can be seen in polycythemia. The EST test is considered cheap and can be a basic screening test. It is also useful in following up of some diseases such as joint diseases [4]. The present reference technique for ESR determination is Westergren method. However, there are many new tools for help determine ESR such as automated ESR analyzer. The recent study showed that the automated ESR has acceptable diagnostic properties and can be used in clinical practice [5].

THE BASIC MECHANICS OF ERYTHROCYTE SEDIMENTATION RATE

The basic mechanical principle can be used for explanation of the ESR test. The falling of the red blood cells or erythrocyte in blood when it is leaved in a tube and placed vertically is the basic phenomenon during ESR test.

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The measurement of the falling rate in one hour is the main determination during the test. The factors that affect the ESR rate include the erythrocyte, blood and gravity. For example, increased blood viscosity can counteract the falling. This is observable in erythrocytosis. On the other hand, the anemia, the problem with decreased red cell mass, the opposite problem might occur. Therefore, it is no doubt that the basic fluid mechanics principle can be well used for explanation of the ESR test [6].

**CONFLICT OF INTEREST:** None

**REFERENCES**


