

## Serum Alpha-1-antitrypsin Evaluation by Three Electrophoretic, Enzymatic and Immunodiffusion Methods

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### Abstract

**Background & Objective:** Alpha-1-antitrypsin (AAT) is the major component of the human plasma alpha-1 globulin proteins and acts as a major inhibitor of proteolytic enzymes, particularly elastase. AAT deficiency is accompanied by lung, liver and other disorders, therefore, AAT is clinically important and its precise evaluation is diagnostically critical. In present study serum AAT was evaluated by three Cellulose Acetate Electrophoresis (CAE), Trypsin Inhibitory Capacity (TIC) and Single Radial Immunodiffusion (SRID) methods and results were compared.

**Materials and methods:** AAT evaluation was carried out, by CAE, SRID and TIC Methods, on 318 normal sera obtained from volunteer students of Tehran Universities.

**Results:** The results indicated: 34, 84 and 112 samples by TIC, SRID and CAE methods (with reference ranges of 2.1-3.5  $\mu\text{mol}/\text{min}/\text{ml}$ , 126-226 mg/dl and 2-4.5% respectively) were abnormal; 201 samples by CAE and TIC were normal and 29 abnormal, 83 sera were normal by TIC and abnormal by CAE; five of them were abnormal by TIC and normal by CAE; 227 of the samples were normal and 29 abnormal (TIC and SRID); 57 were normal by TIC and abnormal by SRID and seven samples were abnormal by TIC and normal by SRID.

**Conclusion:** Although CAE and alpha-1 globulin band determination are routine in clinical laboratory, they are not reliable in evaluating AAT. SRID sensitivity is more than CAE and less than TIC; therefore, TIC is recommended as a precise and reliable method for serum AAT evaluation.

**Key Words:** Alpha-1-antitrypsin, Cellulose Acetate Electrophoresis, Single Radial Immunodiffusion, Trypsin Inhibitory Capacity