Abstract

**Background** – Adenosine deaminase (ADA) and 5′-nucleotidase (5′-NT) play crucial role in adenosine metabolism in healthy individuals. However, adenosine metabolism and role of ADA and 5′-NT in regulating adenosine level inside the cell as well as in serum of bronchial asthma patients and correlating these changes with severity of asthma is not known clearly.

**Methods** - Blood (10 ml) was collected and serum, lymphocytes and erythrocytes separated, followed by determination of adenosine levels and assay of activities of ADA, its isoenzymes (ADA1, ADA2) and 5′-NT in serum and lysates of lymphocytes and erythrocytes in 45 patients of bronchial asthma classified into three groups viz. mild persistent, moderate persistent and severe persistent and 15 healthy control.

**Results** - In bronchial asthma patients, adenosine levels in serum, lymphocytes and erythrocytes were found to be raised significantly as compared to healthy controls (p<0.0001). A significant reciprocal correlation existed between adenosine levels in serum, lymphocytes and erythrocytes of asthma patients and FEV1 (% of predicted). The 5′-nucleotidase activity in serum and lymphocytes was raised significantly in moderate and severe persistent groups and a significant inverse correlation existed between 5′-nucleotidase activity and FEV1 whereas in erythrocytes it was raised only in severe persistent group and FEV1 (% of predicted) had no correlation with the 5′-nucleotidase activity. The activities of ADA, ADA1 and ADA2 were decreased significantly in serum and lymphocytes of moderate and severe persistent asthmatics (p<0.0001) and a significant positive correlation existed between ADA and FEV1 (% of predicted). In erythrocytes, the ADA activity increased in mild persistent group but remains unchanged in moderate and severe persistent group in comparison to healthy control.

**Conclusion** - The present study provides evidence in favour of adenosine for its role as a crucial inflammatory mediator in asthma and suggests that adenosine levels tend to increase in serum, lymphocytes and erythrocytes with the severity of bronchial asthma. The balance between ADA and 5′-NT determines the levels of adenosine in serum and lymphocytes which may result in pathogenesis of bronchial asthma, or vice versa.

**Biography**

Jitender Sharma did his M.B.B.S. from prestigious S.N. Medical College Agra (U.P.) and after that post graduate degree i.e. M.D. (Biochemistry) from V.P. Chest Institute, University of Delhi, Delhi. He has worked on Adenosine Metabolism in Bronchial Asthma patients of different severity and analyzed the levels of adenosine and activities of enzymes adenosine deaminase, its isoenzymes and 5′-nucleotidase in serum and lysate of lymphocytes and erythrocytes during his M.D. dissertation. His post-masters research included studying pharmacogenomics of β-adrenergic receptors and CRH receptors in Bronchial Asthma and to find out responder and non-responder to salbutamol and budesonide drugs. Currently, he is working as a Consultant Biochemist at Central Hospital, Northern Railways, India and his current profile is to analyze various biochemical parameters in clinical specimens (more than 2000 tests per day) for diagnosis of various pathological conditions. He is actively involved in various scientific interactions, activities and meetings across the globe, as a member of esteemed scientific bodies.