INTRODUCTION

Acute bronchitis is one of the most common diseases presented by cough and fever. It is acute tracheobronchial inflammation; caused by pyogenic organism and viruses predisposed by various factors like cold, damp, dusty, atmosphere air pollutants. The inflammatory reaction causes mucinous and inflammatory secretions and injure the tracheobronchial mucosa leading to lung tissue damage. Lactate Dehydrogenase (LDH) is found in all human tissues, its normal serum concentration is due to normal tissue breakdown, which significantly increases after tissue damage. There are five LDH isoenzymes present in blood, which are classified according to their electro-photoretic mobility. LDH-1 moves faster while LDH-5 is the slowest one. Increased LDH isoenzymes levels indicate the organ specific origin of disease such as LDH-1, LDH-2 in heart, erythrocytes, kidneys and brain; LDH-3 in lungs, pancreas, adrenals, spleen, thymus, thyroid, lymph nodes and leukocytes; LDH-4 in skeletal muscles and the LDH-5 in liver.

SUBJECTS AND METHODS

Patients were collected from Out Patients Department of Liaquat University Hospital Hospital Jamshoro/ Hyderabad, Sindh - Pakistan. Study included both male and female subjects between ages of 20-40 years after getting consent on a proper proforma. Twenty five patients and 20 matching healthy subjects were selected excluding other possible diseases supposed to interfere the results e.g., diabetes mellitus, tuberculosis, thyrotoxicosis etc. Samples were collected in plain bottles on 2nd day of acute febrile condition of distressing cough, chest pain and fever. Serum was separated and applied for electrophoresis according to the method by Moses and Ross, using cellulose acetate as medium, barbital tris citrate buffer pH 8.5, voltage 350 V for 30 minutes. Separated isoenzyme bands were stained by layering over an agar gel reaction mixture containing lactate substrate, buffer, NAD, nitro-blue-tetrazolium and phenazine methosulphate, followed by de-staining and then densitometry for quantitative results. Total serum LDH estimation was performed by spectrophotometer using the kits from Merck Company. All the experiments were carried out in the laboratory of Biochemistry Department University of Sindh, Jamshoro.
serum LDH with remarkable rise in serum LDH-3 can be used as the marker for (1) diagnosis of disease indicating extent and the severity of lung tissue damage (2) prognosis, to assess treatment and drug effectiveness, (3) to save the patients from developing the chronic course of disease by guiding to control further damage to lung tissue and other resultant health hazards. Further, serum electrophoretic analysis of LDH and LDH isoenzymes is good diagnostic and prognostic tool, and the results can be obtained within short time and are cost-effective.

REFERENCES
7. Boldy DA, Skidmore SJ, Ayres JG. Acute bronchitis in the community; clinical features, infective factors, changes in pulmonary function and bronchial reactivity to histamine. Resp Med. 1990; 84:

**DISCUSSION**
In acute bronchitis, the predisposing factors and causative agents cause bronchial epithelial injury followed by lung tissue damage resulting in the release of LDH-3 into extracellular fluid followed by rise in serum levels, thus giving general rise of total LDH and remarkable rise in LDH-3 values in serum. The diagnosis of acute bronchitis is purely clinical without standardized diagnostic signs and sensitive or specific confirmatory laboratory tests. Different studies had been performed for diagnosis of this disease and identification of causative organisms but none was found successful to establish confirm diagnosis. In our study, significant rise of LDH-3 in serum of acute bronchitis patients was seen as compared to healthy normal controls indicating excessive lung tissue damage and release of isoenzymes in blood which is helpful in diagnosing acute bronchitis like the role of other isoenzymes in diagnosing different diseases e.g. cardiac or hepatic diseases. While significant rise of total LDH is due to relative rise in LDH-3. In confirmation to our study, high LDH and its isoenzymes were found in other similar studies on infants and children suffering from acute bronchitis. This study also can be utilized in prognosis of acute bronchitis by monitoring effect of treatment which can be helpful in arresting the progress of disease otherwise going chronic course e.g. chronic bronchitis, COPD, etc. Drugtjen, et al in one of his study has also demonstrated the response of treatment on LDH levels in idiopathic pulmonary fibrosis.

**CONCLUSION**
It is concluded that in acute bronchitis; increased total LDH and isoenzymes LDH-3 (65.60±1.92mu/ml) were significantly higher (p<0.001) as compared to control subjects. However, isoenzymes LDH-1, LDH-2, LDH-4, LDH-5 were not statistically significant as compared to controls.

### TABLE I:
VALUES OF TOTAL SERUM LDH AND LDH ISOENZYMES IN ACUTE BRONCHITIS PATIENTS
(The values are in mean ± S.E.M)

<table>
<thead>
<tr>
<th></th>
<th>Total LDH</th>
<th>LDH Isoenzymes</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>LDH-1</td>
</tr>
<tr>
<td>Control (n=20)</td>
<td>188.82±7.72</td>
<td>86.3±2.70</td>
</tr>
<tr>
<td>Acute bronchitis patients (n=25)</td>
<td>260.84±7.08</td>
<td>90.16±1.40</td>
</tr>
<tr>
<td>p-value</td>
<td>&lt;0.001</td>
<td>N.S</td>
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</tbody>
</table>

* Statistically significant as compared to controls. N.S = Non-significant.

**AUTHOR AFFILIATION:**

**Dr. Abdul Shakoor Memon** *(Corresponding Author)*
Assistant Professor
Department of Biochemistry
Liaquat University of Medical & Health Sciences
Jamshoro, Sindh – Pakistan.

**Prof. Habibullah Qureshi**
Biochemistry Department
Muhammad Medical College, Mirpurkhas, Sindh - Pakistan.

**Prof. Muhammad Ali Memon**
Department Of Biochemistry
Isra University Hyderabad, Sindh - Pakistan.

**Dr. Badar-u-Din Memon**
Senior Medical Officer
NIMRA, Jamshoro

**Prof. M. Saleh Memon**
Department of Biochemistry
Muhammad Medical College, Miprurkhas, Sindh - Pakistan.