Rheumatic Heart Disease in East Pakistan

M. IBRAHIM, M.B., F.C.C.P.
Dacca, East Pakistan

**Introduction**

Since the beginning of this century rheumatic fever has been studied more thoroughly and various theories have been postulated, ascribing the disease to non-specific streptococcal infection,\(^1\) allergic to non-specific allergen,\(^2\) virus hypothesis,\(^3\) and streptococcal beta-haemolyticus infection with abnormal antigen-antibody response.\(^4,\,5,\,6\)

With advance in the field of bacteriological investigations, especially those of Lancefield and Griffith, it is now apparent that epidemiology of rheumatic fever is related closely to the incidence of preceding streptococcal illness. More informative and interesting researches have been made recently by Rammelkamp and others,\(^7\) in their studies on “the Epidemiology of Rheumatic Fever in Armed Services.” The variation in the incidence of rheumatic fever in these studies has been shown to be independent of season, and indicated to have little direct effect of altitude, climate or humidity. They conclude that overcrowding, dampness, economic factors, effect the incidence of rheumatic fever only because they are related to the incidence of streptococcal infection in general. Why a certain section of the population under similar environmental condition suffers from rheumatic fever has not yet been settled excepting the indication that “host factor” plays a significant role either by their susceptibility or by their exaggerated antibody response.

In the field of experimental medicine recent works of Murphy and his colleagues\(^8\) denotes a great advance in the pathogenesis of rheumatic fever. At last myocardial Aschoff bodies have been produced in rabbits after focal cutaneous infection with group A streptococci. Exaggerated antistreptococcal antibodies (antistreptolysin O) have been noted in their blood, and in addition an interesting observation on the hypertrophy of adrenal cortices with histopathological changes has been observed. The peculiarity of host factor has once more been substantiated by the experimental method.

However no proper study of rheumatic fever has been done in tropical countries. Price\(^9\) avoids the subject by stating that it is more prevalent in temperate and humid climate than in others. Boyd\(^10\) states “in the tropics, where Haemolytic streptococci are rarely found in the throat, scarlet fever is unknown and rheumatic fever is very uncommon.” Paul White\(^11\) says “permanent residence in the tropics is preferable if a ‘rheumatic family’ can readily arrange it.”

In “The Symposium of Rheumatic Fever” edited by Thomas Lewis in which the subject has been dealt with exhaustively, it has been asserted that this disease is “rare in the tropical countries” but as the autopsy record on the people of Guam during World War II by Zimmerman showed
pathological evidence of old rheumatic heart disease in many cases, it has been concluded that rheumatic fever was unrecognised as a clinical entity.

Factors which are so far known to contribute to the causation of rheumatic fever are all present in a tropical country like East Pakistan. Its geographical conditions are described below:

Eastern Pakistan is situated between 20°75' and 26°75' North latitude and 88-92.4° East longitude. Its capital Dacca is exactly 90°E. of Greenwich.12 Nearly the whole of the province belongs to one natural region—the lower Ganges Valley or Deltas Region. It consists of the vast alluvial plain of the deltas of the mighty rivers, the Ganges and the Brahmaputra, which originate in the Himalayas to the north and flow into the Bay of Bengal in the south. Thus the major part of the country is traversed by the rivers and rivulets which remains inundated about four to five months during the rainy season (Wet Summer).

The tropic of cancer bisects the province (passing through the District of Dacca) and the climate is therefore tropical.13 There is a wide variation of temperature in different parts of the country, the southern part being characterized by double maximum temperature up to 100°-105°F. with an average temperature 95°-90°F. whereas the coastal areas veering around 80°F. The year has been divided into four seasons. Winter (December to February), Dry Summer (March to May), Wet Summer (June to September) Autumn (October and November) according to temperature and rainfall.

The rainfall varies from 60″-120″. Because of heavy rainfall the country is always green and does not dry up. The humidity of the place is high ranging from 70 to 98 per cent; thus the climate is mostly damp.

Eastern Pakistan has a population of 41,932,329 with an area of 54,141 sq. miles, the density of the population to square miles amounts to 774 in general but owing to its peculiar geographical condition the concentration of population is highest around active rivers. This forms two belts of thickly populated areas, where the density varies from 1000-1500 per sq. mile as shown in the map. The people of East Pakistan are mostly agrarian, economically backward and generally live on joint family system.

Considering these climatic conditions, it would have been surprising if the disease had not been prevalent in this country. Low socio-economic conditions among the masses both in urban and rural areas, overcrowding, bad hygienic and insanitary conditions are common. Climatic condition favourable to the growth of bacteria, persists in the environment and soil throughout the whole year. Naturally and logically sore throat, tonsillitis and upper respiratory tract infections, mostly of group A. streptococcal origin are not infrequent among the children. This throat condition along with enlargement of the tonsillar glands, if considered together would be found in nearly 75 per cent of children and adolescent groups. The above conditions are contributory to causation of rheumatic condition and as a matter of fact in the author’s experience, rheumatic heart disease is common, producing a complicated social problem for this country which is still too young to have proper rehabilitation or cardiac centres. The
same view is held by Drs. D. N. De, J. C. Banerjee and A. K. M. Abdul Wahed, Professors of Medicine in Calcutta and Dacca Medical Colleges. The latter always taught that "Rheumatic fever is as common in Bengal as in other parts of the world where its incidence is frequent."

**Clinical Materials**

The author as one of the consulting physicians had opportunity to study rheumatic fever in a general ward of Dacca Medical College Hospital, the only organised institution of the country with a population of 42 millions. The criteria of admission was the urgency of the patients' condition rather than any special disease. Therefore cases such as typhoid fever, acute malaria, kala-azar, pneumonia, cerebral thrombosis, gastro-duodenal ulcers, Hodgkin's disease, etc., used to get admission in preference to chronic rheumatic heart disease. Acute rheumatic fever and congestive cardiac failure not infrequently come to the ward as acute cases. Occasionally, of course, chronic rheumatic carditis with mitral and aortic valvular diseases were admitted when the wards were not congested. In the course of five years from January, 1949 to December, 1953, the total number of patients admitted in the Medical Wards was 19,011 of which acute rheumatic fever and rheumatic heart disease were 606. Other particulars of these cases are detailed below and in Tables I to IV, and given in the appendix.

**Analysis of Cases**

1. Total number of patients 606
   A. Acute rheumatic fever 85
   B. Chronic rheumatic carditis 521
      (a) Mitral valvular lesions 486
      (b) Aortic and mitral valvular lesions 24
      (c) Aortic valvular lesions 11

2. Age group vide Table I

3. Sex—Male 403
   Female 203

4. Complications:
   (a) Auricular fibrillation 94
   (b) Congestive cardiac failure 262
   (c) Sub-acute bacterial endocarditis 11
   (d) Pulmonary infarct 13
   (e) Cerebral embolism 4

**Investigations**

As a routine the following investigations were done in each case:

(a) Clinical history including past history, family history and personal history.

(b) Haemoglobin, red blood cell count, white blood cell count with differential.

(c) Sedimentation rate.
(d) Skiagram of chest in different views.
(e) Screening with barium swallow.
(f) Electrocardiogram whenever possible.
(g) Examination of urine, stool and sputum.
(h) Throat swab examination especially if the case was acute.
(i) Blood culture in acute and febrile cases.
(j) Other special examinations as indicated including photographic records of rheumatic carditis with valvular lesions, skiagrams and necropsies.

Clinical Features:

Patients presented themselves with different clinical pictures:

1) The commonest form was sudden febrile onset in young person, of age group 5 to 15 years, associated with pain and swelling of ankle and knee joints of one side or other. The attack then migrated to the next group of joints as wrist, hip, and shoulder within 48 to 72 hours. By the time the second group of joints were involved, the first group thus constituting a typical flitting polyarthritis. If patients were outside the hospital more than a week they usually received antimalarial and antityphoid treatment without benefit. Clinical examination revealed pallor and tachycardia out of proportion to fever. Occasionally rheumatic nodules were demonstrable. Examination of the heart revealed diffuse pulsation over

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Total No. of Cases</th>
<th>Per Cent</th>
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<tbody>
<tr>
<td>1 - 5</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>6 - 10</td>
<td>26</td>
<td>4.3</td>
</tr>
<tr>
<td>11 - 15</td>
<td>94</td>
<td>15.2</td>
</tr>
<tr>
<td>16 - 20</td>
<td>116</td>
<td>19.2</td>
</tr>
<tr>
<td>21 - 25</td>
<td>85</td>
<td>14.0</td>
</tr>
<tr>
<td>26 - 30</td>
<td>84</td>
<td>13.9</td>
</tr>
<tr>
<td>31 - 35</td>
<td>55</td>
<td>9.1</td>
</tr>
<tr>
<td>36 - 40</td>
<td>37</td>
<td>6.2</td>
</tr>
<tr>
<td>41 - 45</td>
<td>29</td>
<td>4.8</td>
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<tr>
<td>46 - 50</td>
<td>27</td>
<td>4.5</td>
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<tr>
<td>51 - 55</td>
<td>22</td>
<td>3.6</td>
</tr>
<tr>
<td>56 - 60</td>
<td>19</td>
<td>3.2</td>
</tr>
<tr>
<td>61 - 65</td>
<td>7</td>
<td>1.2</td>
</tr>
<tr>
<td>66 - over</td>
<td>4</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>606 cases</td>
<td>100.0</td>
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the apex with a soft first sound and associated with a systolic murmur and in some cases a diastolic murmur. Examination of the throat occasionally revealed congestion or obvious tonsillitis but frequently tonsillar glands were enlarged.

(2) Insidious onset: Young adult of age group 16-25 years, presented with the history of breathlessness on normal exertion, gradually becoming worse in the course of three to six months without previous attacks of acute rheumatic fever. Clinical examination revealed signs of mitral stenosis in the heart with its typical presystolic thrill and rumbling diastolic murmur, ending in accentuated first heart sound.

(3) Women of child bearing age (25 to 40); mother of two or three children; complained of attacks of breathlessness from fifth or sixth month of pregnancy. Previous pregnancies were uneventful. Clinical examination revealed typical mitral stenosis. There might have been a history of arthritis of a flitting nature, in childhood or adolescence but there was no adverse episode during this long interval till the present attack.

(4) Elderly men and women aged 40 to 45 presenting with obvious signs and symptoms of congestive cardiac failure. There might be no past history of acute rheumatic fever. Clinical examination revealed auricular fibrillation, marked enlargement of heart with valvular lesions, usually both mitral and aortic.

(5) Fairly active young men suddenly having haemoptysis reported to the tuberculosis clinic, and subsequently referred back as non-tuberculous

FIGURE 1

FIGURE 2

*Figures 1 and 2 (Case 2): A case of rheumatic carditis with cardiac failure, initial stenosis.*
TABLE II—TYPES OF LESIONS

<table>
<thead>
<tr>
<th></th>
<th>No. of Cases</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Acute rheumatic fever</td>
<td>85</td>
<td>14</td>
</tr>
<tr>
<td>2. Mitral stenosis</td>
<td>480</td>
<td>79.2</td>
</tr>
<tr>
<td>3. Mitral valvular &amp; aortic lesions</td>
<td>24</td>
<td>4.0</td>
</tr>
<tr>
<td>4. Aortic incompetence</td>
<td>9</td>
<td>1.5</td>
</tr>
<tr>
<td>5. Mitral incompetence</td>
<td>6</td>
<td>1.0</td>
</tr>
<tr>
<td>6. Aortic stenosis</td>
<td>2</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>606</td>
<td>100.0</td>
</tr>
</tbody>
</table>

haemoptysis to the general hospital. Clinical examination showed it to be a typical case of mitral stenosis.

(6) Young men with obvious dyspnoea of recent origin. Clinical examination revealed typical carotid pulsation, water-hammer pulse and enlarged heart with signs of aortic incompetence. Not infrequently these cases presented themselves with history of cardiac asthma.

(7) Occasionally adult patients reported with symptoms of hemiplegia of sudden onset. Clinical investigations revealed the cases to be rheumatic carditis with mitral valvular lesion, having cerebral embolism.

(8) Occasionally patients have been sent to a hospital as cases of kala-azar or typhoid fever because of continued fever with splenomegaly. Clinical examination and investigations disclosed the cases to be subacute bacterial endocarditis in rheumatic carditis.

Associated Diseases and Conditions

Since East Pakistan is still an underdeveloped country, it has some preventable and endemic diseases prevalent throughout the year, with periodic increase in their intensities. Malaria, kala-azar, typhoid group of fevers, dysenteries, influenza and common cold, infectious fevers such as measles, smallpox and chickenpox, diphtheria, cerebrospinal fever, helminthiasis and specially ankylostomiasis are common. The last is one of the most common causes of severe anaemia in the mass population of

TABLE III—COMPLICATIONS OF 606 CASES

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Atrial fibrillation</td>
<td>94</td>
<td>15.2</td>
</tr>
<tr>
<td>2. Congestive cardiac failure</td>
<td>262</td>
<td>43.2</td>
</tr>
<tr>
<td>3. Subacute bacterial endocarditis</td>
<td>11</td>
<td>1.8</td>
</tr>
<tr>
<td>4. Embolism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulmonary</td>
<td>13</td>
<td>2.1</td>
</tr>
<tr>
<td>Cerebral</td>
<td>4</td>
<td>0.7</td>
</tr>
<tr>
<td>5. Heart block</td>
<td>8</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>392</td>
<td>64.3</td>
</tr>
</tbody>
</table>
the country. Of course all other conditions enumerated above cause a condition of low vitality and anaemia among people. Tuberculosis in itself is another serious problem for this society.

Rheumatic heart diseases cause incapacity quicker among this population. Cardiac reserve is lost early and congestive failure sets in comparatively rapidly. The convalescence becomes more protracted and cardiac failure recurs during convalescence. The reasons are obvious. Even without organic heart disease many persons suffer from anaemia, hypoproteinaemia and congestive cardiac failure following ankylostomiasis, chronic malaria and kala-azar even when these conditions are controlled with specific therapeutic measures. What happens is that owing to their diverse socio-economic condition, the majority is in a state of malnutrition. Few people can afford to have proper rest and treatment or extra nourishment with antinaemic factors during convalescence and not infrequently they are obliged to undertake exertion prematurely.

Management

Acute rheumatic fever cases are put on sodium salicylate 150 to 200 grain in adult and proportionate dose according to the age, and the response is often dramatic within 47 hours. This response is also considered as diagnostic of rheumatic fever. If it is not as satisfactory as expected, the diagnosis is either reviewed or more often careful clinical examination reveals some complications as pericarditis, pneumonia or other associated conditions. Almost always antinaemic treatment is required simultaneously as iron, acid and liver extract in tropical macrocytic anaemia. Antibiotic and chemotherapeutic drugs are used whenever there is

![Figure 3](http://journal.publications.chestnet.org/pdfaccess.ashx?url=/data/journals/chest/21301/)  ![Figure 4](http://journal.publications.chestnet.org/pdfaccess.ashx?url=/data/journals/chest/21301/)

*Figures 3 and 4 (Case 3): A case of mitral stenosis.*
sign of infection especially in the throat. In case of cardiac failure, digitalis preparations are used. In those cases which are not responsive to digitalis or the progress is stationary, especially with normal pulse rate, mercurial diuretics are used with beneficial response. Sleeping pulse rate, temperature and sedimentation rate are recorded regularly to assess the progress and activity of the condition. Cortisone and ACTH have been used for the last few months with good results in acute cases but the number is too limited to be of any statistical value.

APPENDIX I—ILLUSTRATIVE CASE RECORDS

Case 1: Miss S. B., a 15 year old student was admitted to the hospital on March 4, 1960 with 10 days' history of fever with flitting polyarthritis affecting ankles, knees, elbows and wrists in that order. She had an attack of tonsillitis two weeks previous to the onset of the present complaints.

Family history: Parents living and healthy. She had four elder brothers and one younger sister. The second brother was undergoing domiciliary treatment for pulmonary tuberculosis.

Physical examination disclosed a fairly well nourished moderately built, anxious looking girl. She was markedly pale and her temperature was 102 degrees F. Pulse 124, respiration 36. Her wrist and elbow joints were red, swollen and tender with all movements restricted and painful. Few tender nodules could be palpated around knee and ankle joints although there was no evident swelling. Examination of the heart revealed only tachycardia. Other systemic examinations revealed no abnormality.

Investigations: Haemoglobin 70 per cent, red blood cells 2.5 millions, white blood cell count 5800 with normal differential count. Sedimentation rate 92 mm. per hour. Throat swab did not show growth of Streptococcus haemolyticus on repeated examinations. Skiagram of chest was normal.

Management: She was put on sodium salicylate 120 grains daily for three days and the response was satisfactory. She became afebrile within 48 hours. Her pain and swelling of joints subsided, the sedimentation rate came down to 30 mm. on the fifth day. The dose of salicylate was reduced and she was kept in the hospital for six weeks with general and antianaemic treatment.

Case 2: B. Z., a 20 year old village farmer reported to the out-patient department on January 6, 1953 with chief complaint of exertional dyspnoea of six months duration. Past history and family history were non-contributory. Physical examination revealed a malnourished, moderately built young man without evident dyspnoea. Examination of the heart showed apical impulse on the fifth space, on left midclavicular line with presystolic thrill. The first sound at the mitral area was accentuated and preceded by a rumbling crescendo murmur. Other systemic examination was normal. There was no sign of activity, his pulse rate was 90 per minute and sedimentation rate 12 mm. per hour. Fluoroscopy and skiagram showed typical mitralisation of the left border (Fig. 1) and displacement of the oesophagus by enlarged left auricle with barium swallow in the right anterior oblique position (Fig. 2).

During his six weeks' hospitalization he had no episode of dyspnoea and he was discharged to attend out-patient department for any recurrence.

Case 3: A. G., a muslim woman aged 30 years, wife of a village school master was admitted to the hospital on February 2, 1953 with one months' history of palpitation, breathlessness and occasional oedema of legs. She was five months pregnant. Her previous three pregnancies and confinements were uneventful. All the children were

<table>
<thead>
<tr>
<th>TABLE IV—SEX INCIDENCE</th>
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<tbody>
<tr>
<td>Sex</td>
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<tr>
<td>-----</td>
</tr>
<tr>
<td>1. Male</td>
</tr>
<tr>
<td>2. Female</td>
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<td>TOTAL</td>
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fairly healthy. She admitted having suffered from fever with flitting polyarthritis when she was 10 years old. Her family history suggested that her father died of congestive cardiac failure and her mother and only brother were subjects of rheumatism. Physical examination revealed her to be moderately nourished, anaemic with evident oedema of feet and legs. Her temperature was 98 degrees F. Pulse 100, respiration 30. She did not show prominent neck veins or enlargement of liver but examination of her heart revealed moderate enlargement with soft first sound partly replaced by a harsh systolic murmur and a long mid-diastolic murmur. Pulmonary second sound was accentuated and reduplicated. Skigram of chest showed typical mitralisation of the heart with enlarged left atrium in the right anterior oblique view (Figs. 3 and 4). She was asymptomatic with rest, general and antianaeemic treatment. She was transferred to the maternity ward to consider sterilization after confinement. Cardiogram showed: Right sided hypertrophy. Prominent P in limb leads and S is almost absent in V,

**Case 4:** A. C., a Hindu man aged 43 years, a jute dealer, was admitted to the hospital in congestive cardiac failure. He dated his symptoms of breathlessness and occasional oedema of feet from the age of 30 for which he had to be hospitalized twice during the last three years. There was a past history of rheumatic fever at the age of 15 years.

Physical examination revealed a fairly well nourished man with evident dyspnoea, prominent neck veins and oedema of both feet, legs, thighs and genitalia. Pulse was 118 and respirations were 30 per minute. The temperature was normal. Examination of the heart showed considerable cardiac enlargement with a heaving apical impulse at the sixth space in the left anterior axillary line. The mitral first sound was replaced by a systolic murmur. The second sound was indistinct and followed by a mid-diastolic murmur. In the aortic area there were a short systolic and a blowing diastolic murmur. Blood pressure was 115/70. Abdominal examination revealed ascites, and enlarged and tender liver extending four fingers breadth below the right costal margin. There was basal congestion of both lungs. X-ray film of the chest showed marked enlargement of heart. Fluoroscopy revealed enlargement of the left atrium and moderate enlargement of both right and left ventricles.

**Case 5:** A. T., aged 20 years, a businessman attended the tuberculosis clinic for sudden haemoptysis while coming back from his office on the previous evening.

Past history, family history: Non-contributory. He was referred from the clinic with the note “Non-tubercular haemoptysis.”

Physical examination disclosed a thin young man with moderate anaemia. Temperature normal. Pulse 100 and respirations 20 per minute.

Examination of the heart revealed typical presystolic thrill, ruffling presystolic murmur ending in the accentuated first sound over the mitral area. Pulmonary second sound was accentuated. Blood pressure 110/80 mm. of Hg.

Investigations: Haemoglobin 65 per cent, red blood cells 3.1 million with normal differential count. Erythrocytic sedimentation rate 10 mm. Fluoroscopy and skigram of the chest confirmed presence of mitral stenosis. Routine examination of stool showed ova of ankylostoma.

Management: He was kept under observation for 3 weeks. There was no sign of activity of rheumatic infection. Pulse became normal on rest and remained between 72 and 80. Antihelminthic and antianaeemic treatment were given and he was released from hospital to attend out-patient department.

**Case 6:** M. M., aged 40 years, shopkeeper, was admitted on September 2, 1952 with history of palpitation and nocturnal dyspnoea of one months’ duration. He admitted exertional dyspnoea for about six months.

Past history of rheumatic fever at the age of 13 and 20 years. His wife and four children are healthy. Physical examination revealed a thinly built, fairly well-nourished, dyspnoeic man. He showed typical carotid pulsation and water- hammer pulse, 110 per minute. Blood pressure was 140 systolic and 40 diastolic.

Heart was enlarged with heaving apical impulse on the sixth space in left anterior axillary line. There was a soft blowing diastolic murmur on the aortic area and a systolic murmur in the mitral area. There were scattered rhonchi over both lungs with a few moist rales at the left base.

Skigram showed marked enlargement of the left ventricle with prominent aortic knuckle. Cardiogram showed: Left ventricular hypertrophy. Chest leads showing diminutive R waves with deep S waves in V, V, V, and V.

Investigations: Haemoglobin 60 per cent, red blood cell three million, sedimentation rate 20 mm. per hour. Wassermann and Kahn tests were negative.

Management: He improved on general treatment and was released with the advice of avoiding over-exertion. He has not had nocturnal dyspnoea for the last year, although he has become a subject of palpitation with slight anxiety.
Case 7: A. R., aged 25 years, the son of a businessman, was admitted on December 4, 1953 with irregular fever for two months, not responding to ordinary chemotherapy and antibiotics. Clinical examination revealed an emaciated anaemic young man. There was moderate degree of clubbing of fingers and toes. Temperature 101 degrees F. Pulse 132, respiration 36 per minute.

There were carotid and brachial pulsations. Examination of the heart showed evidence of mitral and aortic valvular lesion. His spleen was enlarged two fingers breadth below the costal margin, and was soft.

Investigations: Haemoglobin 65 per cent, red blood cells 2.2 million, white blood cell count 8000 c.mm., neutrophils 65 per cent, lymphocytes 25 per cent, monocytes 10 per cent, eosinophiles 5 per cent, sedimentation rate 110 per hour. Urine showed trace of albumin, 100 red blood cells without casts. Blood smears positive to Streptococcus viridians on repeated examinations. Skiagram in recumbent position showed enlarged heart with mitralisation.

Progress: He responded to massive doses of penicillin and supportive treatment and became afebrile after 10 days when suddenly he had haemoptysis with palpable right side of the chest, due to pulmonary infarction from left leg which showed evidence of phlebo-thrombosis. He expired 48 hours after this episode following sudden dyspnoea possibly from massive pulmonary embolism. Autopsy was not allowed.

Case 8: Miss M. K., aged 14 years, was admitted on December 11, 1953 with the history of paralytic of right half of body following sudden unconsciousness while carrying a water jar from the neighbouring pond.

Clinical examination disclosed right-sided hemiplegia with increased deep reflexes and extensor planter response on the affected side. Examination of the heart revealed a typical presystolic murmur in the mitral area ending in accentuated first sound. There was history of rheumatic carditis in the family. One of her brothers was undergoing treatment for congestive cardiac failure with mitral and aortic valvular lesions in the same hospital.

Case 9: B. Z., aged 16 years, a cowboy was admitted to the hospital on December 28, 1953 with congestive cardiac failure of one month's duration. He gave a history of rheumatic fever when he was eight years old and exertional dyspnoea for six months. On physical examination he was orthopnic, cyanosed and looked exhausted. His neck veins were prominent and pulsatile, and he had oedema of the inferior extremities, abdominal wall and both hands. There was ascites with tender enlarged liver to the level of umbilicus. Examination of the heart revealed bulging of the precordium with diffuse pulsation. Apical impulse was visible at the sixth left space in the anterior axillary line. The first sound in the mitral area was replaced by a systolic murmur and there was a long diastolic murmur. The aortic area revealed a rough systolic murmur conducted upward along the neck. Cardiac rhythm was irregular. Pulse 100, irregularly irregular, low volume and tension, blood pressure, 112/30. Moist rales were heard over lung bases.

Progress: He did not respond to treatment and died after three days. Partial autopsy was allowed. The heart was enlarged; there was mitral stenosis. Histopathological section of the cardiac muscles showed degeneration with formation of Aschoff's nodule. Liver showed centrilobular necrosis.

Case 10: N. A., aged 45, a fisherman, was brought to the emergency department on February 5, 1953 with asthma. He gave a history of attacks of paroxysmal nocturnal dyspnoea for three years, specially during winter. For the last six months, his attacks became more frequent and he admitted dyspnoea and palpitation on accustomed exertion during day also. A week prior to his visit he fainted on the boat while fishing and since then he had continuous asthmatic attacks. Past history did not reveal acute rheumatic fever, neither was there venereal disease. Clinical examination revealed typical signs of left ventricular failure. His heart was enlarged; the apex beat was at the left seventh intercostal space in the anterior axillary line with a heaving impulse. Auscultation of the heart disclosed a rough systolic and a blowing diastolic murmur in the aortic area with a soft systolic murmur in the mitral area. His lungs were full of bubbling rales. Blood pressure 150/70 mm. Hg. The pulse was 130/min. and respirations were 40 per minute.

Investigations: Haemoglobin 36 per cent. Red blood cells 1.8 m/c.mm. Skiagram of the chest showed marked enlargement of the left ventricle with a prominent aortic knuckle. He expired within 12 hours of admission in the hospital. Partial autopsy was allowed. Heart was enlarged with marked hypertrophy of the left ventricle. Aortic valves were thick and rough showing evidence of old vegetation. Microscopical examination of the cardiac muscle showed typical Aschoff's nodules.
SUMMARY

In East Pakistan no previous study had been made of the incidence of rheumatic fever and rheumatic carditis. The present study, although of short duration of five years, proved definitely that this disease is significantly prevalent in this part of the world. It has been shown in this paper that the factors so far known to contribute to the causation of rheumatic fever are definitely prevalent in this country. Its geographical condition, climate, socio-economic condition, and prevalence of streptococcal infection are as marked as any other country where rheumatic fever is already known to be prevalent.

Acknowledgements: I gratefully acknowledge the assistance of Dr. M. Hassan, Curator of Pathology department and Dr. Shamsul Huq, my clinical assistant for their invaluable help in preparation of this paper. My thanks are due to Mr. Musa Chunara, student of Medical College for his photographic work. I am really thankful to Col. T. D. Ahmed, Surgeon-General with the Government of East Pakistan for his valuable guidance. I also thank Dr. A. K. M. Abdul Wahed, Principal-cum-Superintendent, Dacca Medical College & Hospital for his permission to publish this paper.

RESUMEN

En el Pakistan Oriental no se habia hecho antes un estudio sobre la incidencia de la fiebre reumática y la carditis reumática.

El estudio presente, aunque de corta duracion de cinco anos, demostró claramente que esta enfermedad prevalece con significación en esta región del Mundo.

Se ha mostrado en este trabajo que los factores hasta ahora conocidos como contribuyentes para causar la fiebre reumática definitamente, prevalecen en este País. Sus condiciones geográficas, clima, situación socio-económica, y prevalencia de la infección de estreptococos son tan marcadas como en cualquiera otro país donde la fiebre reumática se sabe que prevalece.

RESUME

Dans l'Est du Pakistan, il l'existé jusqu'à présent aucune étude sur la fréquence du rhumatisme articulaire et du rhumatisme cardiaque. L'étude actuelle, bien que portant sur une courte période de cinq années, a apporté la preuve certaine que cette affection est particulièrement fréquente dans cette partie du monde. L'auteur montre dans cet article que les facteurs considérés comme susceptibles de contribuer à l'apparition du rhumatisme cardiaque sont prédominants dans cette région. Son état géographique, climatique, ses conditions socio-économiques, et la fréquence des infections streptococciques sont aussi nets que dans toute autre région où le rhumatisme articulaire est connu pour être souvent rencontré.

ZUSAMMENFASSUNG

In Ostpakistan ist zuvor noch keine Untersuchung angestellt worden über die Häufigkeit des rheumatischen Fiebers und der rheumatischen Karditis. Die vorliegende Untersuchung, obwohl nur den kurzen Zeitraum von 5 Jahren umfassend, ergab eindeutig, dass diese Krankheit von beträchtlicher Häufigkeit ist in diesem Teil der Welt. Es ist in dieser Ver-
öffentlichung dargelegt worden, dass die bisher bekannten Faktoren, die zu der Entstehung des rheumatischen Fiebers beitragen, in diesem Land eindeutig vorherrschen. Dessen geographische Umstände, die klimatischen, soziologischen Faktoren und das Vorkommen von Streptokokken-Infektionen sind in der gleichen Weise ausgeprägt wie in irgend einem anderen Land, von dem das Auftreten des rheumatischen Fiebers bereits bekannt ist.

REFERENCES