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Original Article

Evaluation of Renal Function in Kala Azar Patients: A Study of 30 Patients

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Abstract

Renal function was assessed prospectively among 30 Kala azar patients admitted in the Paediatric Department of Rajshahi Medical College Hospital during July 2000 and August 2001, to find any alteration of renal function, complicated by Kala azar. Though splenomegaly and hepatomegaly was observed among 100% and 80% cases, respectively, none was found to have renal enlargement. Routine examination of urine, C/S of urine, X-ray of KUB region and ultrasonography of kidney showed no abnormality, except the presence of trace amount of albumin in the urine of only one (3.3%) patient. Serum urea and serum creatinine level were normal (24.7±3.9 mg/dl and 0.87±0.13 mg/dl respectively). These results suggest that Kala azar usually does not alter and complicate renal function.

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Introduction

Visceral leishmaniasis or Kala azar is a chronic infection of reticule-endothelial system that results from a protozoal infection of Leishmania family. Leishmania is a microscopic parasite that lives in specific animal hosts (sometimes including humans) as aflagellar obligate intracellular amastigotes (2-3 μm in length) within mononuclear phagocytes. The organisms are transmitted from animal to animal or animal to human through a vector particularly the sandfly, *(Phlebotomus)*, where Leishmania exist as flagellated, extracellular promastigotes (10-15 μm length and 1.5-3.5 μm in width). After being bitten by an infected sandfly (when it feeds), the organism is transmitted to a new victim.

Kala azar is common in India, Bangladesh, East Africa, Mediterranean area, China, Soviet countries and Latin America and infects humans, dogs, jackals, foxes and probably rats[1]. In Indian subcontinent, the disease is epidemic and the human species are known to be the chief hosts. When introduced into the uninfected body by the bite of a sand fly, the parasite migrates to the bone marrow, spleen and lymph nodes. The parasite damages the immune system as well as evokes an immune response. Multiplication of leishmania, in Kala azar, takes place by simple binary fission in monocytes and macrophages involving multiple organs especially liver, spleen, bone marrow, lymphoid tissue and the small intestinal submucosa.[1]

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At some places (e.g., Kenya) Kala azar becomes unresponsive to standard doses of Pentavalent Antimony. Continued and prolonged courses may be necessary in these cases, [6,7] Several studies in this relation reveal that kidneys are almost the exclusive routes of Antimony excretion. Assessment of renal function, during therapy, should be a routine procedure at least in these cases of Kala azar patients. In one of these studies a patient with normal renal function developed septic shock with oliguria following first intramuscular injection of Antimony.[7] Creatinine clearance was decreased. However, immediate discontinuation and later reintroduction of therapy after 9 days at a reduced rate resulted in complete recovery with normal renal function. Although there are no specific guidelines for dosage adjustment of Antimony in renal failure, the possibility of renal toxicity with Antimony therapy can not be overlooked. Therefore, assessment of renal function should be done during Kala azar therapy, at least when prolonged, continued and higher doses are necessary.

Protozoal diseases are more prevalent in tropical countries like, Bangladesh. Visceral leishmaniasis is more common than other forms of leishmaniasis and is endemic, in Bangladesh. In tropics, certain protozoal and viral infections are recognised as secondary causes of glomerulonephritis, although renal involvement in parasitic infections is polymorphic. Though rare, but cases of Visceral leishmaniasis complicated by renal involvement, have been reported.[2] Here, at Rajshahi Medical College Hospital, we studied 30 cases of diagnosed and uncomplicated cases of Kala azar patients in Paediatric department. The main objective of the study was to see renal function in Kala azar patients.

Methodology

Thirty children patients of Kala azar of varying age groups were studied prospectively in the Paediatric department of Rajshahi Medical College Hospital during July 2000 to August 2001. The patients were diagnosed clinically as well as by laboratory findings. Detailed history regarding duration and type of fever, appetite and loss of body weight were obtained. A complete physical examination was done. The following laboratory investigations were done for all the patients, viz., CBC, haemoglobin level, ESR, thin and thick film of blood to exclude malarial parasite, Widal and Weil-Felix reaction (to exclude enteric fever and rickettsial fever respectively) and X-ray chest to exclude Tuberculosis and Cardiomegaly, ECG was also recorded in all the cases. For diagnostic purposes aldehyde test as well as direct agglutination tests were done in all the cases. Spleen and Bone marrow puncture were done in selected cases. Serum creatinine and serum urea levels were estimated in all cases to assess renal function. For study purposes, routine examination of urine, urine culture and sensitivity test, X-ray of KUB region and ultrasonographic study of kidney were done. The Kala azar patients, who had histories of previous kidney diseases, tuberculosis, malaria or enteric fever, were excluded from the study. Statistical Package for the Social Sciences (SPSS for Windows, release 9.0) was used for statistical analysis.

Results

The study population, 30 in number, ranged in age (Table-I) from 3 years to 10 years (7.9±2.15 years). Sex distribution of the cases showed 18 (60%) male children and 12 (40%) female children (Table-II). The patients were from rural, Kala azar endemic areas around Rajshahi City. Of them 46.6% from Dingadoba followed by 20 cases from Charghat.

All the patients (100%) gave history of fever, in common, for a duration ranging from 1 to 12 months (5.03±2.44 months). Only 13.3% children had associated cough for the last 1 to 3 months (2.0±1.15 months). About 20% patients complained of loss of body weight for a period ranging from 1 to 4 months (2.5±1.05 months). Only 6.7% patients complained abdominal pain.

All (100%) the patients were found to have splenomegaly. Hepatomegaly was found among 24 (80%) of the study subjects but none of them had either renal or cardiac enlargement (Table-III).

Serum urea and serum creatinine were found to be 18.0 to 35.0 mg/dl (24.7±3.9 mg/dl) and 0.6 to 1.2 mg/dl (0.87±0.13 mg/dl), respectively. Routine examination of urine revealed presence of albumin in only one (3.3%) case. Findings of ultrasonographic study and plain X-ray KUB region of all patients showed no abnormality. None of the microbial culture and sensitivity tests of urine, done for all the case, revealed any growth.

Table-I: Age distribution of Kala azar patients (n=30).

Age	No. of patients	Percentage
0—5 years	06	20
6—10 years	24	80
Total	30	100

Table-II: Sex distribution of Kala azar patients (n=30).

Sex	No. of patients	Percentage
Male	18	60
Female	12	40
Total	30	100

Table-III: Organomegaly in Kala azar patients (n=30).

Organomegaly	No. of patients	Percentage
Splenomegaly	30	100
Hepatomegaly	24	80
Cardiac enlargement	00	00
Renal enlargement	00	00

Table-IV: Sex distribution of Kala azar patients by serum urea and creatinine level.

Blood Biochemistry	Female patients (n=12)		Male patients (n=18)	
	Mean	Std. dev.	Mean	Std. dev.
Serum Urea (mg/dl)	23.96	3.6	25.2	4.0
Serum Creatinine (mg/dl)	0.88	0.15	0.87	0.13

Table-V: Sex distribution of Kala azar patients by R/E for urine and C/S of urine.

Examination of urine	Female patients (n=12)	Male patients (n=18)
R/E of urine	No abnormality detected	Albuminuria 1 (3.33%)
C/S of urine	No growth	Not growth

Table-VI: Sex distribution of Kala azar patients by X-ray of KUB region and ultrasonographic study of kidney.

Nature of investigation	Female patients (n=12)	Male patients (n=18)
X-ray KUB region	No abnormality detected	No abnormality detected
USG of kidney	Normal study	Normal study

Discussion

This prospective study was done in the department of Paediatric, Rajshahi Medical College Hospital, in collaboration with the department of Physiology and Biochemistry, Rajshahi Medical College, during July 2000 and August 2001. The main objective was to assess renal involvement of Kala azar patients especially in children. A total number of 30 children patients of varying age groups, ranging from 3 years to 10 years, were included in this study. Out of thirty patients, 18 (60%) were male and 12 (40%) were female. Though, rare cases of visceral leishmaniasis complicated by renal involvement have been reported. A case of visceral leishmaniasis with acute renal failure has been reported in Spain.[2] In a French study parasite induced nephropathies like acute glomerulonephritis, nephritic syndrome or acute interstitial nephritis are also reported.[4] Here, in Bangladesh, a case of visceral leishmaniasis with acute glomerulonephritis has been reported by Azhar et al.[5] But, in our study we did not find any sort of renal involvement or abnormal renal function complicating Kala azar. In one study a patient with normal renal function developed septic shock with oliguria, following Antimony treatment. Creatinine clearance was decreased in this patient.[7] But we did not have any such experience in our study.

Though involvements of multiple organs like liver, spleen, bone marrow, lymphoid tissue etc., in Kala azar is well known, but renal involvement is a less reported finding. Renal involvement may be part of the pathology triggered by immune response provoked by the parasite or it may be due to direct invasion of the kidney by the parasite. Abnormal renal function in some cases of Kala azar may be a result of nephrotoxic effect of antimony compounds used for treating Kala azar. However, prior evaluation of renal function, in the management and treatment of Kala azar patients is drawing increasing attention of the physicians. More extensive studies are needed with bigger sample size and with more sophisticated and more sensitive tests for studying renal function before coming to a definite conclusion regarding renal involvement in Kala azar patients.

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