

To determine the relationship of cutaneous leishmaniasis with deranged aminotransferases

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Abstract

Objective The objective of study is to determine the relationship of Cutaneous Leishmaniasis (CL) with the derangement of aminotransferases.

Methods A Prospective study was carried out in the dermatology outpatient department of Punjab Rangers Teaching Hospital for a period of six months from September 2022 to February 2023 on a group of 30 Rangers Soldiers deployed in Kashmir which is an endemic area of cutaneous leishmaniasis. The patients presenting with nonhealing plaques and ulcers who tested positive for LD bodies on slit skin smears were enrolled. Liver function tests of all the patients were done at the baseline and recorded. Patients with comorbidities, or who were previously on some other drugs were excluded from the study.

Results Amongst our thirty enrolled patients, thirteen showed raised alanine and aspartate aminotransferases, four showed increased alanine aminotransferases (ALT) and two showed increased aspartate aminotransferases (AST) only, which makes 63.3% of our total sample size.

Conclusion Derangement of alanine and aspartate aminotransferases were observed in patients with cutaneous leishmaniasis.

Key words

Cutaneous leishmaniasis; Raised aminotransferases.

Introduction

Cutaneous leishmaniasis, a parasitic, zoonotic disease caused by flagellate protozoa of genus leishmania is declared as the most common clinical form of leishmaniasis.^{1,4} It has also been labelled by WHO as one of the most prevalent yet neglected tropical diseases.¹⁻³ There are 3 clinical manifestations of Leishmaniasis

including visceral, mucocutaneous and cutaneous and the most common variety is cutaneous while visceral is the most severe.^{5,4} CL is transmitted by phlebotomine sand fly (*P. sergenti* and *P. papatasi*) as it injects promastigotes in human skin.⁴ It has been reported in literature that higher levels of Leishmania specific pro inflammatory cytokines especially TNF-a and IL-1b are noticed in patients with longer duration of untreated cutaneous ulcers leading to hepatic injury which eventually increases aminotransferases.¹⁰ Interleukin 1b being the fundamental mediators

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of pro inflammatory response is known to augment liver damage during chronic and acute tissue injury,¹¹ whereas, during an acute inflammatory response, TNF-a produced by monocytes/macrophages causes cell death which in turn causes increase in AST and ALT.^{12,13} The presence of apoptotic neutrophils and their interaction with macrophages infected with leishmania in nonhealing cutaneous ulcers determines the progression of disease and levels of parasite load in macrophages.^{3,14} The present study is designed to see the derangement of liver function tests including both alanine and aspartate aminotransferases with cutaneous leishmaniasis based on an incidental observation at the first presentation of these patients. Patients included in our research were ranger personnel who've been previously posted in Kashmore, Sindh which is an endemic area of Pakistan for CL.⁸

Objectives

To determine the relationship of cutaneous leishmaniasis with deranged aminotransferases as the effect of leishmania specific antigen on hepatic enzyme is very seldomly found in literature especially cutaneous type of disease.

Methodology

A Prospective study was carried out in the dermatology outpatient department of Punjab Rangers Teaching Hospital for a period of six months from September 2022 to February 2023 on a group of 30 Rangers Soldiers deployed in Kashmore which is an endemic area of cutaneous leishmaniasis. The patients presenting with nonhealing plaques and ulcers who tested positive for LD bodies on slit skin smears were enrolled. Liver function tests of all the patients were done at the baseline and recorded. Patients with comorbidities, or who were previously on some other drugs were excluded from the study.

Result

Out of total 30 enrolled patients, 13 showed significant increase in both ALT and AST while 2 showed borderline increase only in AST and 4 patient had raised ALT (**Figure 1**), making total 63.3% of our patients with raised aminotransferases.

According to our p values stated in **Table 1**, the relation between raised aminotransferases in our patients before treatment of CL is significant as our p value is 0.050045 for AST i.e., <0.05 and

Table 1

Sr. No	ALT (Upto 42 IU/L)	AST (Upto 32 IU/l)
1.	44	46
2.	21	27
3.	75	64
4.	32	24
5.	19	29
6.	41	29
7.	36	27
8.	56	42
9.	70	38
10.	21	21
11.	203	126
12.	73	36
13.	104	90
14.	40	24
15.	32	34
16.	38	30
17.	38	76
18.	46	31
19.	17	22
20.	38	23
21.	92	43
22.	36	26
23.	72	83
24.	55	40
25.	94	45
26.	117	367
27.	78	65
28.	332	236
29.	76	38
30.	63	42

- SD of ALT is 61.32.
- SD of AST is 70.52.
- P value of ALT is 0.050045.
- P value of AST is 0.049002.
- P value of combine ALT and AST is 0.05002.

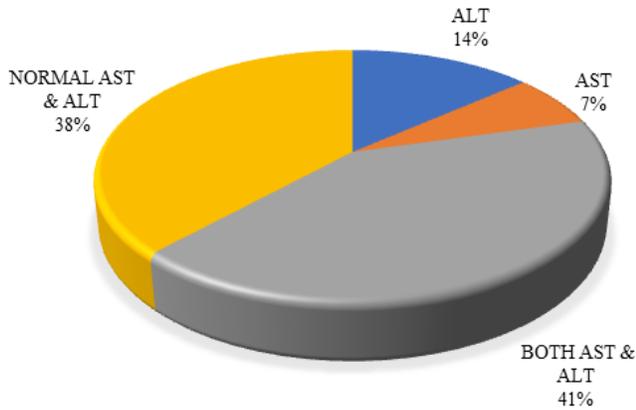


Figure 1 Raised: ALT, AST

for ALT its 0.049002 which is also <0.05 . Hence significance of p value determines that cutaneous leishmaniasis has direct relation with deranged aminotransferases.

Discussion

Punjab Rangers Teaching hospital Lahore is a tertiary care teaching hospital where we receive ranger's employees' who have been deployed in endemic areas of CL from all over Pakistan to be diagnosed and treated. There was an observation that many of the patients of cutaneous leishmaniasis had deranged aminotransferases on their baseline testing. This left us with a hypothesis that there existed some association between cutaneous leishmaniasis and the hepatic enzymes, but it was desired to test this hypothesis. The rationale of the current study was to see if we could actually establish an association or it was just an incidental finding.

A similar Indian study done in a tertiary care hospital on Visceral Leishmaniasis to build an association between the disease and hepatic function showed 51% patients with raised AST and 32% with raised ALT at the time of patient's admission whereas in our study 63.3% showed raised enzymes.⁹ The difference from the current study is that it was conducted on visceral

leishmaniasis and not the cutaneous variety.

A similar pattern of raised AST was also observed in Iraqi research done in 2020 on 150 patients of cutaneous leishmaniasis which compared p-values of AST and ALT before and after the treatment. It reported slight increase in AST (47.8 ± 34) with a normal ALT at the baseline.⁷ The derangement of AST is similar to our study but unlike the current study, ALT is reported normal.

Two studies reported the adverse effect of treatment of cutaneous leishmaniasis on the hepatic aminotransferases. One conducted in Brazil showed deranged ALT in 33% patients and increase of AST in 26%.¹⁵ Another study on leishmaniasis done in Military Hospital Quetta, Balochistan on 42 patients also showed raised ALT to more than four times, and raised AST to more than 2 times of the baseline during treatment therapy with miltefosine.⁸ The difference of both these from the current study is that the derangement of aminotransferases is reported after treatment with antiparasitic drugs whereas our study reports raised levels at the baseline and these studies did not relate any effect of the disease on the liver enzymes.

Literature surfing shows some relevance of this association however a strong consensus is yet to be built. The incidental finding of deranged liver enzymes among many of our patients could never be ignored, so it was highly required to collect some information regarding this association which led us to carry out this research.

From the results of the current study, we can conclude that there exists some relation between the disease and the liver, however, We, as dermatologists still need to gather more data pertinent to this disease and its impact on the liver functioning as vitality of a healthy liver is

very important in maintaining the health of the patient. Early diagnosis and appropriate referral stands highly desired here.

Conclusion

We conclude from the results of the current study that cutaneous leishmaniasis is associated with derangement of liver enzymes including both ALT and AST.

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