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Letter to the Editor

Total serum cholesterol determination can provide understanding of parasite burden in patients with visceral leishmaniasis infection

Dear editor

Visceral leishmaniasis (VL), generally called kala-azar, occurs in several Mediterranean countries, and most frequently affects children ≤6 years. Nearly half of the VL cases occur in children (childhood or pediatric VL) [1]. The clinical manifestations of childhood VL are more or less the same as in adults. Marked enlargement of spleen and liver with moderate to severe anemia, pancytopenia are the presenting features [1]. The incidence of kala-azar in India is among the highest in the world [2,3]. Most of the districts of Bihar State in India are endemic. The diagnosis of the VL patients is done by the intracellular demonstration of parasite in the bone marrow/splenic aspirate, which is an invasive procedure and particularly very painful for the children. Recombinant product (rK39) of 39 amino acid repeats encoded by a kinesin-like gene of visceral *leishman* spp. was observed as diagnostic and of prognostic value in Indian leishmaniasis [4]. Parasitic burden could contribute to the clinical severity of the disease. Hence, there is a need for the early understanding of parasite burden in the clinically suspected VL patients. Since the role of cholesterol in parasitic infection has been reported [5], and hypocholesterolemia has been observed in pediatric visceral leishmaniasis [6], we considered investigating the relationship of total serum cholesterol with the parasite burden which has not yet been reported till date.

We investigated total serum cholesterol concentration in 60 clinically and parasitological confirmed VL patients (male = 39 and female = 21). The median age of study subjects in male category was 22 years (range 4–55 years) and in female was 18 years (range 5–35 years).The total serum cholesterol was determined by an enzymatic colorimetric assay using diagnostic kit (Merck diagnostic, India) on the chemistry analyzer (Microlab-200/300, The Netherlands). The parasite load was determined as per the standard quantitation grading [7]. The present studies revealed that total serum cholesterol level in VL patients was inversely proportional to the parasite load (Fig. 1). The total serum cholesterol level in normal healthy subjects ranged between 145 and 240 mg/dl. The authors propose that 95% confidence interval (C.I.) of serum cholesterol level ranging between 105 and 118 mg/dl is indicative of 1+ parasite load, serum cholesterol level ranging between 80 and 90 mg/dl is indicative of 2+ parasite load, serum cholesterol level ranging between 61 and 69 mg/dl is indicative of 3+ parasite load and serum cholesterol level ranging between 48 and 52 mg/dl and between 38 and 43 mg/dl are indicative of 4+ and 5+ parasite loads respectively in VL patients (Table 1). The 95% C.I. of total serum cholesterol level for each category of parasite load is non-overlapping which indicates significant difference of serum cholesterol levels between two consecutive categories and also among all the categories of parasite load. The frequency of correct decision using 95% C.I. of serum cholesterol level with decision based on parasite burden is shown in Table 1. This study reveals that on an average, 60% correct decision can be made using serum cholesterol with decision based on parasite burden serving as the "gold standard".

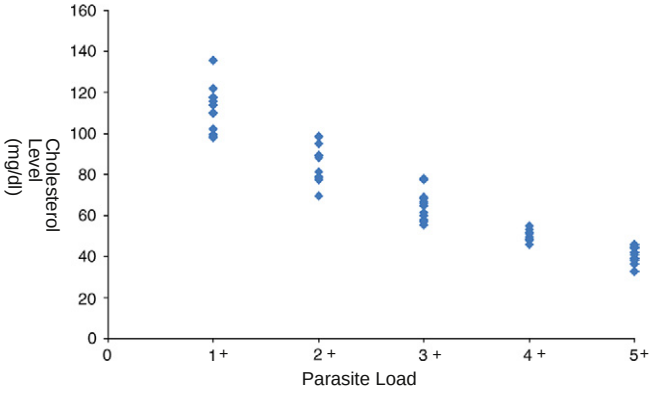

Fig. 1. Individual cholesterol level (mg/dl) in relation to parasite load.

Table 1
Comparison of decision levels based on serum cholesterol concentration at 95% C.I. with different parasite loads.

Parasite load	95% confidence interval (C.I.) of cholesterol level	Decision level (%)
1+	105–118	67
2+	80–90	50
3+	61–69	58
4+	48–52	75
5+	38–43	50

The rK39 strip test, which is commercially available as rapid diagnostic test for VL, combined with the total serum cholesterol will provide an additional early understanding of parasite burden during clinical examination of suspected VL patients and in this way, the invasive procedure, i.e., bone marrow/splenic aspiration technique can be avoided particularly in pediatric age group. Hence, it is proposed to determine total serum cholesterol concentration along with rK39 strip assay in clinically suspected VL cases. This observation also provides a roadmap to the researchers to explore the novel importance of cholesterol in the pathogenicity of VL.

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