Original Article

Evaluation of Lipid Profile in Leprosy Patients

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ABSTRACT

Background: Leprosy is a chronic infectious disease that, inspite of its ancient origin, still affects thousands of people throughout the world. It is caused by Mycobacterium leprae, which mainly affects the skin and peripheral nerves, leading to sensory loss in the skin, muscle weakness and often permanent disabilities of hands and feet. Leprosy is now known to be neither sexually transmitted nor highly infectious after treatment. Approximately 95% of people are naturally immune and sufferers are no longer infectious after as little as 2 weeks of treatment It is completely curable by using multi drug therapy. Mycobacterium leprae was discovered in 1873, by G. H. Armauer Hansen in Norway, therefore leprosy is referred as Hansen's disease. It is a mutilating, debilitating, devastating and deforming disease.

Objective: To evalualate the lipid profile in leprosy cases and compare them with healthy control subjects.

Study Design: Case Control Study.

Place and Duration of Study: Present study was carried out in the Department of Biochemistry, Basic Medical Sciences Institute, Jinnah Post Graduate Medical Centre, Karachi, in collaboration with Marrie Adelaide Leprosy Centre (National Training Institute of Leprosy Control Programme), Karachi from June 2009 to May 2011.

Materials and Methods: A total of 60 newly diagnosed leprosy patients of both sexes and all ages were included in this study, among them 44 males and 16 females, aged 13 to 70 years (mean 37.8 ± 1.71 years). The diagnosis were on clinical ground and bacterial examination by slit skin smear test and 30 age, sex matched healthy control subjects were taken from general population for comparison. Informed consent was taken from each patient and control subject for this study.

Results: All the lipid fractions except HDL cholesterol were decreased significantly high ($p<0.01$) where as HDL Cholesterol was increased significantly ($p<0.05$) in leprosy patients when compared with control group. In present study total cholesterol was 127.1 ± 1.46 mg % , Triglyceride 111.7 ± 1.68 mg % , HDL Cholesterol 45.4 ± 0.89 mg % and LDL Cholesterol 80.2 ± 1.72 mg % in leprosy subjects.

Conclusion: It is concluded that, all the lipid fractions except HDL cholesterol were decreased significantly high , where as HDL Cholesterol was increased significantly in leprosy patients when compared with control group, which are in favour of lepers.

Key Words: Leprosy, Lipid profile.

INTRODUCTION

Leprosy is a chronic infectious disease that, in spite of its ancient origin, still affects thousands of people throughout the world. It is caused by Mycobacterium leprae, which mainly affects the skin and peripheral nerves, leading to sensory loss in the skin, muscle weakness and often permanent disabilities of hands and feet [9]. Leprosy is now known to be neither sexually transmitted nor highly infectious after treatment. Approximately 95% of people are naturally immune and sufferers are no longer infectious after as little as 2 weeks of treatment It is completely curable by using multi drug therapy [3].

Mycobacterium leprae was discovered in 1873, by G. H. Armauer Hansen in Norway, therefore leprosy is referred as Hansen's disease. It is a mutilating, debilitating, devastating and deforming disease. Over the last 25 years with the efforts of leprosy control programs and multi drug therapy (MDT) leprosy have decreased world wide dramatically prevalence from approximately 5.4 million cases in 1985 to 212,802 registered cases during the start of 2008, [20,21,22]. Lipid metabolism in leprosy have examined in Various studies, but there has been limited work using whole metabolite profiles [2].

The intracellular germ Mycobacterium laprae mediate strong inflammatory response in affected individuals and cause gross destruction of tissues during the chronic course of infection [18]. Among all mycobacteria it is likely the most dependent on the host for basic metabolic functions, in part because of its extensive genomic decay [5]. Leprosy is not a killing disease, it is a crippling disease and if not treated early and properly,

may form permanent deformities [6]. The signs and symptoms may be ignored in the early stages until visible disabilities have not occurred [12].

Leprosy affects both sexes but males are affected more than females and ratio is 2:1.Until coming of AIDS, leprosy was the most feared infectious disease globally. It is still considered to be dreadful infectious disease, so normal healthy people try to avoid and breakup all kind of links to these patients [17]. Leprosy has struck fear into human beings for thousands of years. In the time of Christ it was considered to be a holy curse conferred upon the people due to their wrong doings and the affected unfortunate was totally isolated and discarded. According to some ancient transcript the patients were confined to huge dungeons or well and even tortured and stone to death if they even tried to enter the cities.

Leprosy cases are found world wide, Leprosy remains a public health problem with over 210,000 registered cases in world at the beginning of 2008 [19].

MATERIALS AND METHODS

Present study was carried out in the Department of Biochemistry, Basic Medical Sciences Institute, Jinnah Post Graduate Medical Centre, Karachi, in collaboration with Marrie Adelaide Leprosy Centre (National Training Institute of Leprosy Control Programme), Karachi.

A total of 60 newly diagnosed leprosy patients of both sexes and all ages were included in this study, among them 44 males and 16 females, aged 13 to 70 years (mean 37.8 ± 1.71years). The diagnosis were on clinical ground and bacterial examination by slit skin smear test and 30 age, sex matched healthy control subjects were taken from general population for comparison. Informed consent was taken from each patient and control subject for this study.After an over night fasting , 5 ml of blood was drawn from anticubital vein after all aseptic measures, blood was allowed to clot at 37ºC, serum was separated

after centrifuged at 3000 rpm for 10 minutes then analyzed. Serum Cholesterol was estimated by the Enzymatic kit method, Serum triglycerides were determined by enzymatic colorimetric (GPO-PAP) kit method,

Serum HDL-Cholesterol was determined by CHOD-PAP kit method 15 (Rifai et al., 2001) and LDL-Cholesterol was calculated according to Friedewald's formula [7].

RESULTS

A total of 30 control subjects 21 males (70.0%) and 9 females (30.0%) and 60 leprosy patients 44 males (73.3%) and 16 females (26.7%) were recruited for this study. Biophysical parameters in leprosy patients were completely non significant when compared with control group.

All the lipid fractions except HDL cholesterol were decreased significantly high ($p<0.01$) where as HDL Cholesterol was increased significantly ($p<0.05$) in leprosy patients when compared with control group. In present study total cholesterol was 127.1 ± 1.46 mg % , Triglyceride 111.7 ± 1.68 mg % , HDL Cholesterol 45.4 ± 0.89 mg % and LDL Cholesterol 80.2 ± 1.72 mg %

Table No.1: Comparison of biochemical parameters in leprosy cases and controls

(Values are expressed as mean ± s.e.m.)

Biochemical parameter	Cases (n=60)	Controls (n=30)
Total Cholesterol (mg %)	127.1 ± 1.46 **	141.5 ± 2.96
Triglyceride (mg %)	111.7 ± 1.68 **	123.7 ± 3.62
HDL Cholesterol (mg %)	45.4 ± 0.89 *	41.3 ± 1.45
LDL Cholesterol (mg %)	80.2 ± 1.72 **	95.2 ± 3.89

* $p<0.05$ Statistically significant

** $p<0.01$ Statistically highly significant

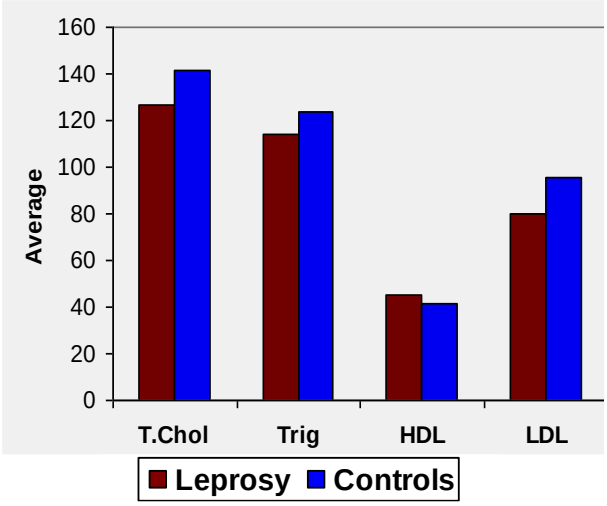

Figure No.1: Comparison of biochemical parameters of leprosy patients and controls

DISCUSSION

Intracellular pathogens evading the host immune response while at the same time accessing metabolic pathways of host, which for mycobacteria depends on the use of host-derived lipids for their survival [14].Metabolism of host-derived fatty acids is required for the synthesis of mycobacterial lipids including virulence factors such as phthiocerol dimycocerosate, sulfolipid-1, and polyketide synthase–derived phenolic glycolipid and therefore, host lipids are used both for growth and virulence [11,15] . Besides the immunological approach to the problem, workers have also attempted to study the biochemical alterations including the study of lipid metabolism as a guide for early diagnosis [1].

The lipids inside the lepra cells may be of host origin and may result in alteration in serum lipids [10]. In this study we found highly significant reduction in total cholesterol in leprosy cases ($p< 0.01$), when compared with control, this observation was in accordance with Gupta *et al*. (2002) [8.] Similarly when the triglycerides levels in the two test groups were compared with control we found statistically highly significant reduction in Leprosy ($p<0.01$). These observations were in accordance with Bansal et al. (1997) [4].

In contrary when HDL cholesterol levels in both the test groups were compared with control we observed increased significantly ($p<0.05$) in leprosy cases. These observations were in agreement with the findings of Bansal *et al*. (1997) [4] .Where as LDL cholesterol was decreased highly significantly in leprosy when compared with control group ($p<0.01$). These observations were in accordance with the Kher *et al*. (1983) [13.]

CONCLUSION

It is concluded that, all the lipid fractions except HDL cholesterol were decreased significantly high ($p<0.01$), where as HDL Cholesterol was increased significantly ($p<0.05$) in leprosy patients when compared with control group, which are in favour of leprosy patients.

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