ABSTRACT
BACKGROUND: To determine the changes in serum lipid profile in a patients with Beta-thalassemia.
MATERIALS AND METHODS: Serum lipid profile were estimated in fifty (50) Beta thalassemic patients and fifty (50) age-and sex-matched apparently healthy well nourished controls by direct enzymatic colorimetric method using Erba XL 640 fully auto analyzer. RESULTS: Mean serum cholesterol, serum HDL and serum LDL were significantly reduced, while serum Triglyceride was significantly higher in thalassemic patient than control group. CONCLUSION: Our results revealed that lipid profile changed in patients with Beta-thalassemia major. Many factors such as iron overload, liver injury, hormonal disturbances and aging might cause these changes.
Keywords: Beta-thalassemia major, Lipid profile, Cholesterol, Triglyceride, High-density lipoprotein, Low-density lipoprotein.

INTRODUCTION
Beta-thalassaemia is a very serious blood disorder since individuals with it are unable to make enough healthy red blood cells and depend on blood transfusion throughout their life. Patient with Beta-thalassemia (β-thalassaemia) major are at risk of an iron overloading in various organs, which is through repeated blood transfusion and increased iron absorption from the gastrointestinal tract. Iron overload may particularly cause injury to the heart, liver and endocrine glands. Iron-induced liver injury is often characterized by the development of fibrosis and eventually, cirrhosis. In Beta-thalassaemia major, liver damage accounts for the low total-cholesterol (TC), high-density lipoprotein cholesterol (HDL-C) and low density lipoprotein cholesterol (LDL-C) serum levels. Moreover, it is known that severe chronic liver disease is characterized both by low total and LDL-cholesterol level and by decrease in HDL-cholesterol. The LDL-lowering effect of Beta-thalassaemia major may be related to 1. The mild erythroid hyperplasia, which would increase the LDL removal by the bone marrow, and 2. The chronic activation of the monocyte-macrophage system, causing an increased secretion of some cytokines (interleukin-1, interleukin-6, and tumor necrosis factor-α) Known to affect to hepatic secretion and the receptor mediated removal of apo-lipoprotein B-containing lipoproteins.

MATERIALS AND METHODS
The cross sectional case control study was conducted in Civil Hospital, Ahmedabad during August 2013 to December 2013. Altogether 100 participants were involved in this study. Patients with thalassemia major were diagnosed by clinical history, requirement for regular blood transfusions, and laboratory tests including complete blood count (CBC) and haemoglobin electrophoresis. Exclusion criteria were having diabetes mellitus, hypothyroidism, hyperthyroidism, renal failure and hereditary hyperlipidemia. Fifty thalassemic patients (n=50), their age range between 9 to 24 years participated in this study. Mean age of participants in case group was 16.5±7.5(mean±SD) The control group consisted of 50 healthy participants matched sex and age distribution. Fifty normal Controls healthy persons (n=50) aged 9 to 24 years were used as control. The mean age of control was found to be 15.2±8.8. They selected from the individuals who referred for check up. About 3 ml of blood samples were collected and allow to clot then centrifuged to obtain the serum. Serum Cholesterol was determined by enzymatic colorimetric-CHOD PAP test. Serum Triglyceride was determined by enzymatic colorimetric-CHOD PAP test. Serum LDL and HDL were determined by Enzymatic colorimetric method using Erba XL 640 fully auto analyzer.

RESULT
Table 1 shows the biochemical results of the examined patients and the control. Beta thalassemia major patients had significantly lower total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C) and low-density lipoprotein
cholesterol (LDL-C) compared with controls (p<0.05). However serum TG levels of β-TM patients (151±22) were significantly higher than in control group (98±22) (p<0.05).

Table 1. Serum lipid profiles in thalassemia patients and healthy subjects (values are reported as mean ± SD)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Patients</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triglycerides (mg/dl)</td>
<td>151±22</td>
<td>98±22</td>
</tr>
<tr>
<td>Cholesterol (mg/dl)</td>
<td>109±10</td>
<td>179±10</td>
</tr>
<tr>
<td>HDL-Ch (mg/dl)</td>
<td>34±5</td>
<td>53±5</td>
</tr>
<tr>
<td>LDL-Ch (mg/dl)</td>
<td>58±8</td>
<td>136±10</td>
</tr>
</tbody>
</table>

TG: Triglyceride; TC: Total cholesterol; LDL-C: Low-density lipoprotein cholesterol; HDL-C: High-density lipoprotein cholesterol.

DISCUSSION

In our study it was found that the majority of the Beta Thalassemic patients had low total cholesterol, HDL-C and LDL-C levels. In addition of that triglycerides levels were substantially high. Results of present study correlate well with previous study (Papanastasiou A et al 1996). It appears because of that many factors such as iron overload, liver injury, and hormonal disturbances affects lipids pattern among patients with beta-thalassemia. Other explanation could be, accelerated erythropoiesis and increased uptake of LDL by macrophages and histiocytes of the reticuloendothelial system are the main determinants of low plasma cholesterol levels and HDL-C were detected in beta thalassemia major.

Triglycerides lipase activities (both hepatic and extrahepatic) were significantly lower in thalassemic patients. Christina speculated that the decreased levels of these enzymatic activities could play a role in determining the decrease of HDL-C observed in thalassaemic patients. The present findings are in agreement with those found by other studies as there is significant increase in plasma TG level, which is the same as detected by Pogana et al. However other researchers did not find such differences.

REFERENCES

8. Papanastasiou A, Siorokou T, Haliotis FA. BetaThalassemia and factors affecting the

Figure 1: Showing Serum TG level in case and control group

Figure 2: Showing Serum Cholesterol Level in case and control group

Figure 3: Showing Serum HDL-C Level in case and control group

Figure 4: showing Serum LDL-C Level in case and control group


