

Original Research Article

Hypolipidemia: a study evaluating magnitude and underlying etiologies of the entity

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ABSTRACT

Background: Hyperlipidemia is a common and well-known entity as it is one of the risk factors of various noncommunicable diseases. Hypolipidemia is an entity which is very less known among health care givers. Currently available data about this entity is insufficient and nonconclusive.

Methods: This study was a prospective observational study. Lipid profile reports at the central lab of the institute was observed and among them hypolipidemia reports and related patients were identified. Patients were further evaluated and classified into 10 etiological categories.

Results: Total 450 lipid profile reports were observed out of which 36 (8%) reports had hypolipidemia. Most patients had hypolipidemia were having chronic illness (41.7%) or critical illness (33.3%) followed by malnutrition (11.1%), idiopathic etiology (11.1%), moderate to severe anemia (8.3%), chronic liver disease (8.3%), cancer (5.5%), statin use for more than 3 months (2.8%), malabsorption (2.8%), hyperthyroidism (0%).

Conclusions: Awareness about hypolipidemia among health care givers is needed to look out for underline diseases with consequences and to have active participation to unsolved the mystery of this entity. Overuse of antihyperlipidemic drugs should be avoided. This study highlighted causes and consequences of hypolipidemia.

Keywords: Anemia, Antihyperlipidemic drugs, Hypolipidemia

INTRODUCTION

Increase incidence and prevalence of non-communicable diseases like hypertension, diabetes, ischemic heart diseases, stroke has brought attention of the world toward hyperlipidemia as it is well known risk factor of these diseases.¹⁻³ The entity hypolipidemia is not in limelight like hyperlipidemia. In fact, there is lack of awareness and knowledge about hypolipidemia among health care givers. Pathogenesis and consequences are still not very clear and established.⁴ By definition hypolipidemia means decrease level of lipoproteins in blood. Hypocholesterolemia, hypobetalipoproteinemia are similar terms used to denote this condition.⁴ There is no universal guideline available about cut off value of serum cholesterol level to define

hypolipidemia. Studies conducted so far took different total cholesterol level as cut off values ranging from 100 to 190 mg/dl.⁴ Etiology of hypolipidemia can be divided in primary and secondary causes. Primary causes include genetic disorders named abetalipoproteinemia, hypobetalipoproteinemia and chylomicron retention disease. Secondary causes are more common and include infections, malabsorption, malnutrition, anemia, chronic inflammatory diseases, critical illness, malignancies, hyperthyroidism, chronic liver diseases, Gaucher disease and drug induced like by statins.⁴ This study included cases of hypolipidemia and various underlying etiologies were identified in order to highlight various aspects of this mysterious entity.

METHODS

This study was conducted at a tertiary care health center named Pacific institute of medical science, Udaipur for the duration of 6 months (June to November, 2018). This study was a prospective observational study. The patients attending the general medicine out patient department during the study period and who were advised to get lipid profile test done in the central laboratory of the institute were included in the study after written informed consent. Inclusion criteria included patients having serum cholesterol less than 130 mg/dl and patients willing to participate in the study. Exclusion criteria excluded patients refused to give informed consent.

Lipid profile reports conducted at the central lab of the institute were observed and among them hypolipidemia reports and related patients were identified. The data of laboratory investigations, etiologies and demographic details of the patients were collected in the form of age, gender, area of residence and education. Hypolipidemia was taken as serum cholesterol <130 mg/dl according to national health and nutrition examination survey I.⁵

Patients having hypolipidemia were further evaluated for etiology of hypolipidemia and divided into 10 categories- 1. Chronic illness, 2. Critically ill or ICU patients, 3. Cancer, 4. Moderate to severe anemia (Hb<10 mg/dl), 5. Thyrotoxicosis, 6. Statin use for more than 3 months, 7. Malabsorption, 8. Malnutrition, 9. Chronic liver disease and 10. Idiopathic. Patients having features of more than one category were considered in each of category.

Data was collected, compiled and entered in MS Excel software and analyzed using SPSS version 24 (SPSS Inc, Chicago IL, USA). All the categorical variables were presented as frequencies and percentages, and all the continuous variables were shown as mean ± standard deviation (SD).

RESULTS

Total 450 lipid profile reports were observed out of which 36 (8%) reports had hypolipidemia. Out of 36 patients, 24 (66.67%) were males while 12 (33.33%) were females with 2:1 male female ratio (Figure 1). The Age range of patients with Hypolipidemia was 39 to 66 years, with mean age of 48.97 (±8.56) years. The majority of study subjects belonged to urban areas (55.55%) and rural residents were 44.45% (Figure 2).

The mean lipid cholesterol level was 88.86(±10.82) mg/dl. Thirty-six patients having hypolipidemia were further evaluated for etiology and classified in above mention 10 categories. Most hypolipidemic patients had chronic illness (41.7%) or critical illness (33.3%) followed by malnutrition (11.1%), idiopathic etiology (11.1%), moderate to severe anemia (8.3%), chronic liver disease (8.3%), cancer (5.5%), statin use for more than 3 months

(2.8%), malabsorption (2.8%). No patient was having hyperthyroidism (Table 1).

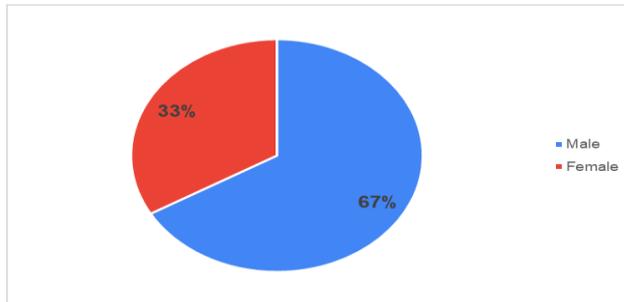


Figure 1: Gender wise distribution of study subjects.

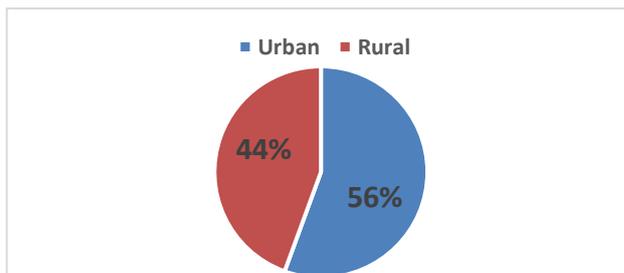


Figure 2: Area wise distribution of study subjects.

Table 1: Distribution of etiological factor among hypolipidemic patients.

Etiological category	No. of patients	Percentage (%)
Chronic illness	15	41.7
Critically ill or ICU patients	12	33.3
Cancer	2	5.5
Moderate to severe anemia (Hb<10 mg/dl)	3	8.3
Thyrotoxicosis	0	0
Statin use for more than 3 months	1	2.8
Malabsorption	1	2.8
Malnutrition	4	11.1
Chronic liver disease	3	8.3
Idiopathic	4	11.1

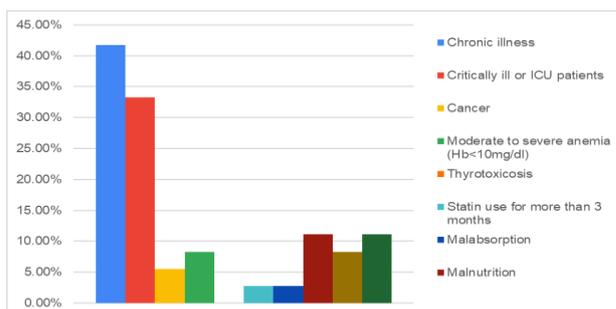


Figure 3: Bar chart etiologic factors among hypolipidemic patients.

DISCUSSION

The current study observed total 450 lipid profile reports out of which 36 (8%) reports had hypolipidemia. According to national health and nutrition examination survey-I, the prevalence of hypo-cholesterolemia (<130 mg/dl) was 1.8% in whites and 3.6% in blacks.⁵ In previous studies in hospitalized patients the prevalence of hypo-cholesterolemia ranges from 0.5 to 6.2%.⁴

In current study most hypolipidemic patients had chronic illness (41.7%) or critical illness (33.3%) followed by malnutrition (11.1%), idiopathic etiology (11.1%), moderate to severe anemia (8.3%), chronic liver disease (8.3%), cancer (5.5%), statin use for more than 3 months (2.8%), malabsorption (2.8%). No patient was having hyperthyroidism.

Not many studies conducted so far highlighted etiologies in one setting. Hypolipidemia may have consequence of adrenal failure especially in critical ill patients as cholesterol is precursor of adrenal hormones.⁴ Hypolipidemic cases are prone for sepsis due to decrease host immunity.⁴ This entity may act as prognostic marker in critically ill patients.⁴

It is postulated that hypolipidemia may lead to anemia by itself as cholesterol is essential component of cell membrane. Cholesterol deficiency leads to rigidity of erythrocytes and increases haemolysis.⁴ Vise versa anemia can cause hypolipidemia although exact etiopathogenesis is not known but possible mechanisms were postulated like increased cholesterol requirement by proliferation of erythroid cells in bone marrow, elevation of serum level of macrophage colony stimulating factor (M-CSF) which have cholesterol lowering effect, hypersplenism and formation of antibodies against low density lipoprotein (LDL).⁴ According to available literature hypolipidemia can be used as marker of prognosis and therapeutic response in aplastic anemia as sustain low serum lipids indicate severe bone marrow failure.^{4,6}

Other adverse effects beside anemia were also mentioned.^{4,8} It is postulated that hypolipidemia is related to increase possibility of intracranial haemorrhage due to fragile endothelium of intracerebral arteries and platelet hypoactivity.⁴ Correlation of hypolipidemia was found with some of the malignancies.⁷⁻⁸ Only positive consequence mentioned is lower incidence of atherosclerosis and related diseases.⁴ Currently available literatures on hypolipidemia are not conclusive. More researches are needed to establish etio-pathogenesis and consequences of hypolipidemia. Overuse of antihyperlipidemic drugs should be avoided to prevent drug induced hypolipidemia. Awareness about hypolipidemia among health care givers is needed to look out for underline diseases with consequences and to have active participation to unsolved the mystery of this entity.

Limitations

The study reviewed 450 reports of lipid profile out of which 36 had hypolipidemia. The sample size of hypolipidemia was small. Study participants were identified by lipid profile reports not by clinical suspicion.

CONCLUSION

Hypolipidemia is an alarming condition for evaluation of underline disease and also for possible dreadful consequences. Awareness among health care givers about this entity is needed. More research work should be promoted to establish universal guidelines.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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