ORIGINAL

Evaluation of risk factors, risk assessment and health-related quality of life in patients with dyslipidemia in Kempegowda Institute of Medical Sciences (Kims) Hospital and Research Centre, Bangalore, India

Evaluación de los factores de riesgo, valoración del riesgo y calidad de vida relacionada con la salud en pacientes con dislipidemia en el Hospital y Centro de Investigación del Instituto Kempegowda de Ciencias Médicas (Kims), Bangalore, India

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Abstract

Background: The research aims to evaluate the risk factors, risk assessment, and health-related quality of life in patients with dyslipidemia.

Methods: This is an observational study conducted for 3 months in a tertiary care hospital setting. All the patients meeting the selected criteria were identified in the outpatient clinic and inpatient wards of the Department of General Medicine. The patients or the caregivers were briefed about the study, and consent was obtained to be recruited.

Results: A total of 200 patients were enrolled in the study based on the inclusion and exclusion criteria, out of which 55% (n=111) were male, and 45% (n=89) were female. The mean age of our study subjects was found to be 55.5±12.1 years. The health-related quality of life of the patient is a combined assessment of the physical component summary (PCS), and mental component summary (MCS). The average of PCS and MCS was 37.1 and 47.3, respectively, indicating an overall average of HRQOL as 42.2, which represents low HRQOL in patients with dyslipidemia.

Conclusion: The result of our study show age, gender, lack of physical activity, overweight, HTN, DM, consumption of alcohol, and smoking were risk factors for dyslipidemia. The present study highlights that patients with dyslipidemia have poor HRQOL as the overall PCS and MCS scores were low. Focus on dyslipidemia management is urgently required in India to halt the rising tide of coronary heart disease.

Keywords: Risk factors, risk assessment, quality of life, dyslipidemia.

Resumen

Antecedentes: La investigación tiene como objetivo evaluar los factores de riesgo, la evaluación del riesgo y la calidad de vida relacionada con la salud en pacientes con dislipidemia.

Métodos: Se trata de un estudio observacional realizado durante 3 meses en un entorno hospitalario de atención terciaria. Se identificó a todos los pacientes que cumplían los criterios seleccionados en la consulta externa y en las salas de hospitalización del Departamento de Medicina General. Se informó a los pacientes o a los cuidadores sobre el estudio y se obtuvo el consentimiento para ser reclutados.

Resultados: Un total de 200 pacientes fueron incluidos en el estudio en base a los criterios de inclusión y exclusión, de los cuales el 55% (n=111) eran hombres, y el 45% (n=89) eran mujeres. La edad media de los sujetos del estudio fue de 55,5±12,1 años. La calidad de vida relacionada con la salud del paciente es una evaluación combinada del resumen del componente físico (PCS), y del resumen del componente mental (MCS). La media de PCS y MCS fue de 37,1 y 47,3, respectivamente, lo que indica una media general de CVRS de 42,2, que representa una CVRS baja en los pacientes con dislipidemia.

Conclusiones: El resultado de nuestro estudio muestra que la edad, el sexo, la falta de actividad física, el sobrepeso, la HTA, la DM, el consumo de alcohol y el tabaquismo fueron factores de riesgo de dislipidemia. El presente estudio pone de manifiesto que los pacientes con dislipidemia tienen una mala CVRS, ya que las puntuaciones globales de PCS y MCS fueron bajas. Es necesario centrarse urgentemente en el tratamiento de la dislipidemia en la India para detener la creciente ola de enfermedades coronarias.

Palabras clave: Factores de riesgo, evaluación del riesgo, calidad de vida, dislipidemia.

Introduction

Despite the high advances in the medical sciences, some diseases caused morbidity and mortality[1-10]. Dyslipidemia is considered a major cause of death in developed and developing countries, according to the estimates by the World Health Organization (WHO), dyslipidemia is associated with more than half of the cases of coronary artery disease and more than four million deaths per year, globally. Lipid abnormalities, including total cholesterol and a high level of low-density lipoprotein cholesterol (LDL-C) and low level of high-density lipoprotein cholesterol (HDL-C), are the most important risk factors for cardiovascular diseases.[11, 12] It is considered a major risk factor for cardiovascular complications. Many studies such as those conducted by the World Health Organization and Framingham have established the association of plasma cholesterol level with the risk of cardiovascular disease. This association also confirmed with the results of a meta-analysis of 10 cohort studies, which stated that for a reduction of 0.6 mmol/L of serum total cholesterol in adults aged over 60 years, the risk of fatal cardiovascular disease decreased by 27%.[13, 14]

The Indian Council of Medical Research (ICMR) surveillance project reported a prevalence of dyslipidemia of 37.5% among adults aged 15-64 years, with an even higher prevalence of dyslipidemia 62% among young male industrial workers.[11] Various studies also reported greater triglyceride levels in rural and urban populations associated with low HDL cholesterol levels.[12, 16]

An important shortcoming of Indian epidemiological studies is the lack of large studies with details of patterns of dyslipidemia. Compared with Western populations, Indians and migrant South Asians tend to have higher triglyceride levels and lower HDL cholesterol while total cholesterol levels are lower than in the US and the UK. Only a few extensive studies have reported the prevalence of different forms of lipid abnormalities among Indians. India Heart Watch study carried out among urban middle-class subjects in 11 cities of India with fasting lipid estimation revealed alarming facts that India is undergoing a rapid epidemiological transition with increasing population, economic prosperity, urbanization, and ageing with associated risk factor transition. An increase in cardiovascular risk and hypercholesterolemia is also associated with increased adverse lifestyles such as greater smoking and tobacco use, change in nutritional habits with greater intake of unhealthy diets, and increasingly sedentary lifestyle. All the risk mentioned above factors have contributed to the sharp rise in the burden of non-communicable diseases, especially coronary heart disease (CHD). Even in rural areas of India, non-communicable and chronic diseases have become the leading causes of death.[12-16]

Health-related quality of life (HRQOL) includes the physical, mental, and social aspects of health and is an essential outcome measure that has gained much attention in recent years. HRQOL specifically focuses on an individual's perception of health and life satisfaction that may be linked with the World Health Organization (WHO) definition of health as "the state of complete physical, mental, and social wellbeing, and not merely the absence of disease and infirmity.[15] HRQOL was assessed by the SF-36, a short form of the Medical Outcome Study. It contains 36 questions. The SF-36 assesses eight health dimensions: physical functioning, role physical limitation, bodily pain, general health, social functioning, role emotional limitation, mental health, and vitality. From these eight scales, it is possible to calculate two summary scores, physical component summary (physical functioning, role physical limitation, bodily pain, and general health) and mental component summary (social functioning, role emotional limitation, mental health, and vitality), and also the overall HRQOL. Certain studies conducted on the impact of health-related quality of life of the patients with dyslipidemia have established a direct association of dyslipidemia with low HRQOL. The major contributing factors identified were rigid dietary prescriptions, medication side effects, the need for regular medical care, and psychological effects.[12] Improvement of HRQOL would be very important in the management of patients with dyslipidemia. The expanding pattern in patients with dyslipidemia makes this assessment exceptionally applicable, to more readily oversee dyslipidemia patients and therefore improve their QOL. The alarming rise in the global prevalence and disease burden of dyslipidemia makes the reports of these studies highly relevant for the effective management of dyslipidemia patients and consequently improve their HRQOL.[13,17] Therefore, this study is proposed with the primary objective to concentrate on identifying various risk factors, risk assessment associated with dyslipidemia, and measuring its impact on patient's HRQOL. Secondary objectives are to evaluate the drug-related problem associated with dyslipidemia management and assess the knowledge, attitude, and practice of dyslipidemia patients towards their illness and treatment.

Materials and methods

The study was conducted at Kempegowda Institute of Medical Sciences (Kims) Hospital and Research Centre, a 500 bedded hospital with state-of-the-art facilities for patients. This study was conducted on patients drawn from the Outpatient clinic and Inpatient wards of the Department of General Medicine.

Patients' meeting with inclusion and exclusion criteria were included in the study. The purpose of the study was explained to the patient and consent was taken. A self-designed case report form was used to collect the patients'
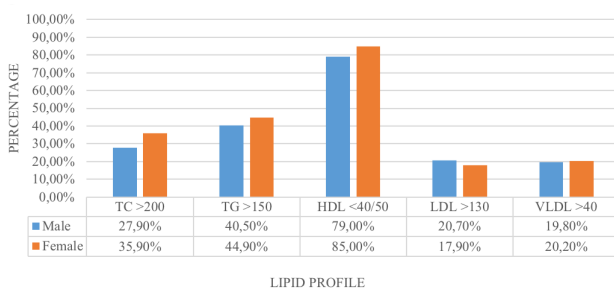
demographic data, medical issues, past medical history, laboratory data, and other relevant information collected by interviewing and referring to their medical records in the hospital (both inpatient and outpatient) documented. Also, the SF-36 (Short form survey) questionnaire was used to interview the patient to assess the patient's health status. The knowledge, attitude, and practice of dyslipidemia patients towards their illness were assessed using the KAP questionnaire. JBS-3, a risk calculator was used to assess the risk factors and risk assessment, both 10-year risk and lifetime risk of CVD in all individuals. This is done by entering the laboratory values obtained during interviewing/ data collection in the JBS-3 risk calculator. PCNE v8.01 is a classification tool used to evaluate drug-related problems by using the data obtained during interviewing/ data collection. All the data collected were entered into Microsoft Excel and an appropriate statistical analysis tool was applied. Categorical variables were presented using tables and graphs. Continuous variables were presented as mean +/- SD. Descriptive statistical methods were used to measure the mean, median, and standard deviation.

Result and discussion

This study included a total of 200 patients drawn from the Outpatient clinic and Inpatient wards of the Department of General Medicine in Kempegowda Institute of Medical Sciences (Kims) Hospital and Research Centre, Bengaluru. The study was conducted from January 2018 to March 2018. Out of the 200 sets of the population enrolled for the study 55.00% were male (n=111), 45.00% were female (n=89). Among the 200 patients, about 60 patients i.e.30%, had habits such as smoking, alcohol, and tobacco use, and the remaining 70% had none. Out of 60 patients' highest number were among the use of both alcohol and smoking and the least were the use of all three. Prevalence of abnormal total cholesterol (TC), triglyceride (TG), high-density lipoprotein (HDL), and very-low-density lipoprotein (VLDL) in women was higher than in men whereas the level of (LDL) was higher in men, as shown in **figure 1**.

Out of the 200 patients involved in the study, most of the patients were found to be between the age group of 55-64 (31.5%), thus as the age increases there is a proportionate increase in the risk of acquiring dyslipidemia.

Figure 1: Prevalence of dyslipidemia.

|	TC >200	TG >150	HDL <40/50	LDL >130	VLDL >40
Male	27,90%	40,50%	79,00%	20,70%	19,80%
Female	35,90%	44,90%	85,00%	17,90%	20,20%

LIPID PROFILE

Prevalence of the disease was seen more in the male population 55% (n=111), than in the female population 45% (n=89). **Figure 2** shows the risk factors of patients.

Figure 2: Risk factors of a patient.

■ Lack of Physical Activity ■ Hypertension ■ Over weight ■ Diabetes ■ Alcohol ■ Smoking
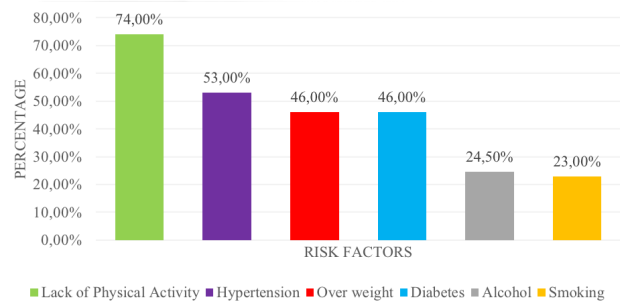
The majority of patients in the study i.e. 74.00% (n=148) were found to have lack of physical activity as a chief risk factor and the least percentage of risk factor was among patients who were smoking i.e. 23.00% (n=46), and other risk factors included hypertension, overweight, diabetes, and alcohol consumption as shown in **figure 3**.
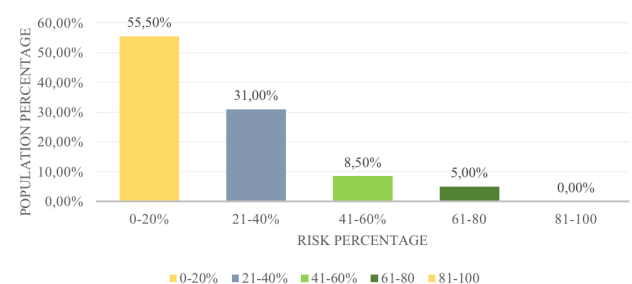
Figure 3: Risk assessment in the male population.

■ 0-20% ■ 21-40% ■ 41-60% ■ 61-80% ■ 81-100%
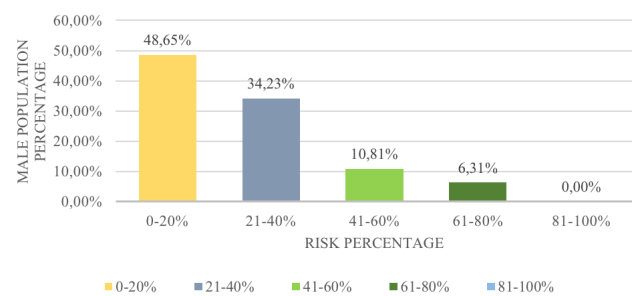
Charlson Co-Morbidity Index (CCI) scoring was done for all the 200 patients in the study to assess the ten-year mortality for a patient who may have a range of comorbid conditions, and the highest average of 2.53 was seen in patients between the age group of 55-64.

Risk Assessment: Joint British Societies-3 (JBS-3) risk score analysis revealed that 55.5% of the study population have the risk of 0-20% for developing CVD in the next 10 years and the least of 5% study population is in between 61-80, as shown in **figure 4**.

Figure 4: Risk assessment of patient.

■ 0-20% ■ 21-40% ■ 41-60% ■ 61-80 ■ 81-100

Risk Assessment in Male Population: JBS-3 risk score analysis to evaluate the risk assessment in the male population revealed 48.6% have risk between 0-20% for developing CVD in the next 10 years, as depicted in **figure 3**.

Risk Assessment in Female Population: JBS-3 risk score analysis to evaluate the risk assessment in the female population revealed 64.04% have risk between 0-20% for developing CVD in the next 10 years, as depicted in **figure 5**.

**Figure 5:** Risk assessment in the female population.
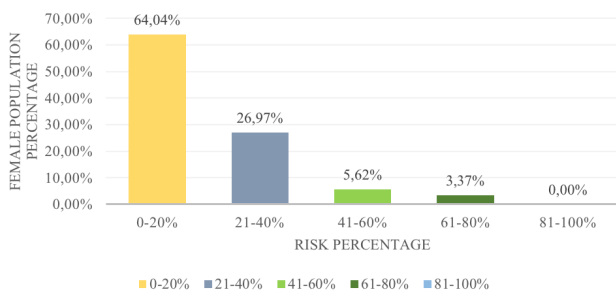
A risk assessment done on a study population of 200, have shown variation by 13.8 years in heart age from chronological age. The average chronological and heart age was 55.5±12.1 and 69.3±17.1 years respectively.

Health-Related Quality of Life Assessment:

Physical component summary (PCS): Analysis of HRQOL in the study population using SF-36 revealed the average of physical functioning (PF), role limitation due to physical health (RLPH), pain, and health change to be 45.7, 28.8, 39.3, and 34.7 respectively. The physical functioning dimension had a better average and the least average was seen in role limitation due to physical health, as shown in **figure 6**.
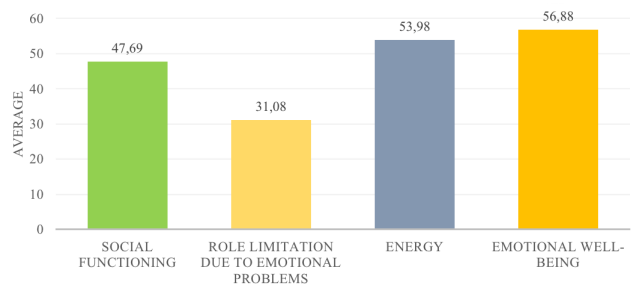
Figure 6: Physical component summary.
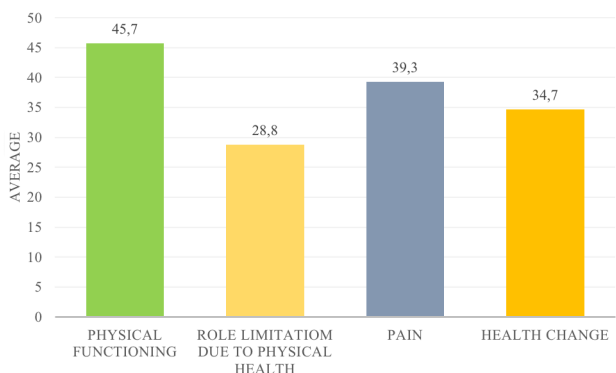
Mental component summary (MCS): Analysis of mental component revealed the average of social functioning, role limitation due to emotional problems (RLEP), energy,

and emotional well-being to be 47.6, 31, 53.9, and 56.8, respectively. Emotional well-being had a better average and the least average was seen in role limitation due to emotional problems, as shown in **figure 7**.

Figure 7: Mental component summary.

Physical and mental component summary: The total average of four dimensions each under MCS and PCS were 47.3 and 37.1 respectively and the overall average of both PCS and MCS was 42.2, as shown in **figure 8**.

Figure 8: Physical and Mental component summary.
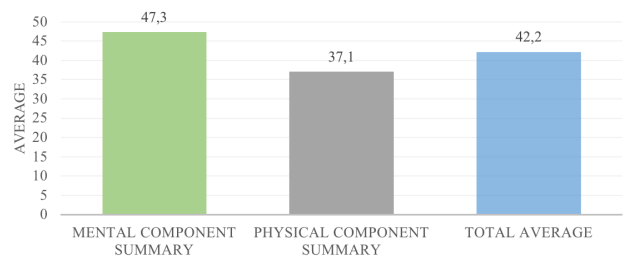
Drug-Related Problems: The drug-related problems identified in our study population includes an inappropriate combination of drugs, the patient uses/takes less drug than prescribed or does not take the drug at all, patient stores drug inappropriately and inappropriate timing or dosing intervals, as shown in **table I**.

Table I: Drug-related problems of the patient.

Drug-Related Problems	Number of patients
C1.4*	05
C7.1	05
C7.6	04
C7.7	04
Total number of DRP	18

*C1.4: Inappropriate combination of drugs or drugs and herbal medication
C7.1: Patient uses/takes less drug than prescribed or does not take the drug at all
C7.6: Patient stores drug inappropriately
C7.7: Inappropriate timing or dosing intervals

Similar researches have been performed in thie filed. Farhat et al. (2016)[18] reported a lower overall QOL score among dyslipidemic patients compared with controls (57.9% and 76.5%, respectively; $p < 0.001$). Waterpipe smoking (adjusted odds ratio (OR_a) = 4.113, 95% confidence interval (CI): 1.696-9.971, $p = 0.002$), hypertension (OR_a = 3.597, 95% CI: 1.818-7.116, $p < 0.001$), diabetes (OR_a = 3.441, 95% CI: 1.587-7.462, $p = 0.002$),

cigarette smoking (OR$_a$ = 2.966, 95% CI: 1.516–5.804, p = 0.001), and passive smoking (OR$_a$ = 2.716, 95% CI: 1.376–5.358, *p* = 0.004) were significantly associated with dyslipidemia in individuals older than 30 years. A higher overall QOL score (*p* = 0.013) was observed in patients treated with statins compared to other lipid-lowering medications. In a survey of Tziallas et al. (2012)[19], Three hundred and fifty-nine subjects were involved of whom 206 (57.4%) met the diagnostic criteria for the MetSyn ("cases") and 153 (42.6%) did not ("comparator group"). Comparisons of SF-36 scores between patients with and without MetSyn revealed statistically significant differences except bodily pain subscale. A predominance of anxiety (60%) and depressive symptoms (67%) was observed among subjects with MetSyn. Patients with MetSyn undergoing a therapeutic approach showed no improvement in its general and mental health (p: NS). Similar findings were reported in surveys conducted in Brazil[20], Iran[21], Romani[22], and USA[23].

Conclusion

The study was conducted in a tertiary care teaching hospital in urban premises of Bengaluru comprising of patients who met the inclusion and exclusion criteria. The majority of the patients enrolled in the study were males, the age distribution seen highest in the age group between 55-64.

The results of our study show age, gender, lack of physical activity, overweight, HTN, DM, consumption of alcohol, and smoking were found. The result of risk assessment revealed 55.5% of the study population has a risk of ≤ 20% and 44.4% of the study population have a risk ≥of 21% of developing CVD in the next 10 years. Comparing actual age and heart age data has shown variation by 13.8 years in heart age from the actual age. The average actual age and heart age were 55.5±12.1 and 69.3±17.1 years, respectively.

The present study highlights the fact that patients with dyslipidemia have poor HRQOL as the overall PCS and MCS scores were low. KAP assessment revealed out of the 200 study population that most of the population lacks knowledge about the disease, but in case of practice and attitude towards the disease, the majority of the population has a positive response. Evaluation of DRPs showed a majority of them were potential drug interactions and poor medication adherence.

Hence, these results highlight the pivotal role of the pharmacist as a health care team provider in the management of dyslipidemia through routine screening programs for blood lipid levels and appropriate intervention programs aimed at risk factor reduction, improve the HRQOL and to reduce the risk percentage for developing CVD in the future, and also improve the knowledge about the disease to the patients, as more information about the disease and its management will empower patients to manage their conditions better. Focus on dyslipidemia management is urgently required in India to halt the rising tide of coronary heart disease.

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