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CP 10

Pattern of dyslipidaemia among healthy adults in Jaffna District, Northern Province, Sri Lanka

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Abstract

Background and objective: Dyslipidaemia is an important modifiable risk factor of cardiovascular disease. Information on the pattern of dyslipidaemia will help to plan interventions to reduce the risk of cardiovascular disease. The objective of this study was to describe the pattern of dyslipidaemia among healthy adults in Jaffna district using secondary data.

Methods: We analysed the lipid profile of 500 healthy adults who underwent basic health screening for non-communicable diseases. Data were extracted from the database of the Regional Directorate of Health Services of Jaffna district. Lipid levels were categorized according to national and international guidelines. Chi-square test was used to determine the associations between dyslipidaemia and age and sex. A p value ≤ 0.05 was considered significant.

Results: Majority of the study sample was women (61.4%) and mean age of the participants was 54.8±12.6 years. Four out of five individuals (78.2%) had at least one type of lipid abnormality. Prevalence of dyslipidemia was highest (84.2%) in the middle age group (40-60 years) and differences in the prevalence by age group were significant (p=0.001). Dylipidaemia was more prevalent among women (83.7%) than men (69.4%) (p<0.001). The most common type of dyslipidaemia (58.4%) was low levels of high-density cholesterol (HDL-C) which was also higher in women (68.4%) compared to men (42.5 %) (p<0.001).

Conclusion: Dyslipidaemia was highly prevalent in Jaffna population and more common among women than men. Like other South Asian populations, low HDL-C was the most common type of dyslipidaemia. Further studies to determine the contributors to dyslipidaemaia would help to plan interventions to improve lipid parameters in the Jaffna population.

Keywords: Dyslipidaemia, cardiovascular risk factos, Jaffna, low HDL-C, South Asians

Introduction

Cardiovascular disease (CVD) is the leading cause of death worldwide and South Asians have a greater risk of developing CVD. Dyslipidaemia is considered an important risk factor associated with CVD in South Asians [1-3]. According to 2019 statistics, ischaemic heart is

the leading cause of death in Sri Lanka [4]. Previous studies have shown a high prevalence of dyslipidaemia among Sri Lankans [5, 6]. These findings suggest that like other South Asians dyslipidaemia could be an important contributor to CVD among Sri Lankans. As ethnic and cultural differences could influence the lipid profile, this paper focuses on the pattern of dyslipidaemia in Jaffna district where almost all the population is Sri Lankan Tamil—one of the major ethnic groups in the country. The aim of this study was to describe the pattern of dyslipidaemia among healthy adults in a predominantly Sri Lankan Tamil population. As dyslipidaemia is a modifiable risk factor of CVD, analyzing the pattern of dyslipidaemia among healthy individuals would provide vital information to plan interventions to reduce CVD.

Methods

We analysed the pattern of the lipid profile of the control group (healthy adults) of a larger study on the lipid profiles of diabetic and non-diabetic patients in Jaffna. The control group was made up of 500 healthy adults who underwent basic screening for non-communicable diseases as part of the programme conducted by the Regional Directorate of Health Services in Jaffna district in 2021 and 2022. This was a cross-sectional analysis of secondary data of 500 healthy adults. Individuals who had no preexisting medical conditions and were not diagnosed with any medical condition during the screening were considered as healthy adults in this study. Adequacy of sample size to show the difference in dyslipidaemia between men and women was determined using the values reported by Katulanda et al. [5, 7]. The lipid profiles of healthy adults were obtained from the Regional Directorate of Health Services of Jaffna district. A data extraction sheet was used to extract information on age, gender, and total cholesterol (TC), low-density cholesterol (LDL-C), triglyceride (TG) and high-density cholesterol (HDL-C) levels from the database. Ethics approval was obtained from the Ethics Review Committee of Teaching Hospital, Jaffna (Ref. No.: S02/08/2021) and administrative approvals were obtained from relevant authorities before commencing data collection.

Based on national and international guidelines [8, 9] normal and abnormal lipid levels were categorized (Table 1). Data were entered in Microsoft Excel (version 16.0) and analysed. Results were summarized as frequencies, percentages, mean, and standard deviation (SD). Chi-square test was performed to determine the association between the presence of dyslipidaemia and age and sex. Age was categorized as <40 years, 40-60 years and >60 years. A p-value equal to or less than 0.05 was considered statistically significant.

Results

Of 500 individuals in the sample, there were 193 (38.6%) men and 307 (61.4%) women. The mean age of the sample was 54.8±12.6 years.

Overall, 78.2% had one or more dyslipidaemia. Prevalence of dyslipidaemia was higher among women (83.7%) than men (69.4%). The difference in the prevalence of dyslipidaemia between men and women was statistically significant ($p<0.001$). Prevalence of dyslipidaemia in the age groups <40 years (n=62), 40-60 years (n=266) and >60 years (n=172) was 75.8%, 84.2% and 69.8%, respectively. Significant difference in prevalence of dyslipidaemia by age group was observed ($p=0.001$). Dyslipidaemia was more prevalent among women in all age groups (Fig. 1). When considering sex, we found a significant difference in the prevalence of dyslipidaemia by age group among men ($p=0.02$) but not women.

Table 1 shows the pattern of dyslipidaemia in the study sample. The proportion of people with suboptimal TC (≥200 mg/dL), LDL-C (≥130 mg/dL), TG (≥150 mg/dL) and HDL-C (men

<40mg/dl and women <50mg/dl) levels were 38.8% (n=194), 35.8% (n=179), 22.8% (n=114) and 58.4% (n=292) of the population respectively. When comparing men and women, suboptimal LDL-C (35.8% vs. 30.6%) and TG (26.4% vs. 20.5%) were more prevalent among men whereas suboptimal TC (36.8% vs. 40.1%) and low HDL-C (42.5 % vs. 68.4%) were more prevalent among women. A statistically significant difference between men and women was observed for low HDL-C (p<0.001).

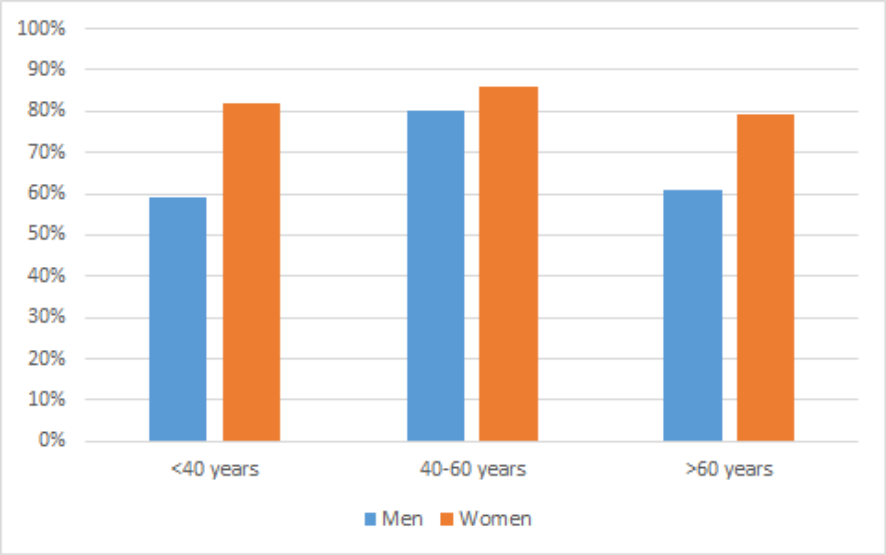

Fig. 1 Prevalence of dyslpidaemia by age group and sex

Table 1 Pattern of dyslipidaemia among healthy adults

Lipid levels	Frequency (percentage) Total population (N=500)	Men (N=193)	Women (N=307)
Total Cholesterol			
Desirable <200 mg/dL	306 (61.2)	122 (63.2)	184 (59.9)
Borderline high 200-239 mg/dL	139 (27.8)	55 (28.5)	84 (27.4)
High ≥240 mg/dL	55 (11.0)	16 (8.3)	39 (12.7)
LDL Cholesterol			
Optimal <100 mg/dL	150 (30.0)	60 (31.1)	127 (41.4)
Near optimal <100-129 mg/dL	171 (34.2)	64 (33.2)	86 (28.0)
Borderline high 130-159 mg/dL	108 (21.6)	49 (25.4)	44 (14.3)
High ≥160 mg/dL	71 (14.2)	20 (10.4)	50 (16.3)
Triglyceride			
Optimal <150 mg/dL	386 (77.2)	142 (73.6)	244 (79.5)
Borderline high 150-199 mg/dL	70 (14.0)	30 (15.5)	40 (13.0)
High ≥200 (2.6)	44 (8.8)	21 (10.9)	23 (7.5)
HDL Cholesterol			
Optimal ≥60 mg/dL	58 (11.6)	24 (12.4)	34 (11.1)
Acceptable men=40-59 mg/dL; women=50-59 mg/ dL	150 (30.0)	87 (45.1)	63 (20.5)
Poor men<40 mg/dL; women <50 mg/dL	292 (58.4)	82 (42.5)	210 (68.4)

Discussion

Prevalence of dyslipidemia in the Jaffna population was high (78.2%). A similar finding was reported by the Sri Lanka Diabetes and Cardiovascular Study (SLDCS) which showed that 77.4% of Sri Lankan adults had one or the other dyslipidemia [5]. High prevalence of dyslipidaemia was also reported among urban South Asians residing in Chennai (82.9%), Delhi (69.3%) and Karachi (73.9%) [10]. Like other Sri Lankan and South Asian populations, dyslipidaemia was more prevalent among women than men in our study as well [5, 10].

Our findings show that the prevalence of dyslipidaemia was higher among the middle age group (40-60 years). Similar age-related differences in prevalence of dyslipideamia was observed in men, while the trend in women was more or less consistent across the age groups.

We found that the prevalence of low HDL-C was higher in women (68.4%) than men (42.5%) in the Jaffna population. A similar observation was reported in the SLDCS study where low HDL-C levels were observed in about one-third of men and two thirds of women [5]. Tennakoon et al. reported a lower prevalence of low HDL-C among Sri Lankans in Oslo (men=27.8%; women=24.7%) than in Sri Lanka and a slightly higher prevalence of low HDL-C in men compared to women in Oslo and in Kandy (58.3% vs 53.3%) [11]. Differences in the environmental and lifestyle could have contributed to the lower prevalence of low HDL-C among Sri Lankan in Oslo. Studies comparing the lipid levels of South Asians and non-South Asians show higher prevalence of low HDL-C among South Asians compared to non-South Asians [12, 13]. It appears that most South Asians including the Jaffna population show a trend towards low HDL-C.

In our study, about one-third of the population (35.8%) had suboptimal LDL-C which was lower than the prevalence reported in Sri Lankans (46.0%) in the SLDCS study [5]. Prevalence of suboptimal LDL-C among urban South Asians (19.1% to 29.1%) was lower than our findings [10]. It has been reported that quality rather than quantity of LDL-C contributes to an increased risk of CAD in South Asians. Ruuth et al. showed that LDL aggregation susceptibility was higher in South Asians compared to Caucasians [14]. These observations show the inconsistency in LDL-C level among South Asian populations and highlight the need for determining the quality of LDL-C in different ethnic groups.

Another characteristic of South Asians is elevated TG. However, our study population had a relatively lower prevalence of high TG level. A suboptimal TG level (≥150 mg/dL) was observed in less than one-fourth of the study population (22.8%) which us similar to the findings (23%) of the SLDCS study [5]. Tennakoon et al. reported a higher proportion of Sri Lankans with high TG levels (≥240 mg/dL for men ≥200 mg/dL for women) in Oslo (men=33.1% and women=25.7%) and Kandy (men=39.7% and women=35.8%) [11]. Compared to the present study, a greater proportion of urban South Asians (30.4% to 34.6%) had suboptimal TG levels [10]. Proportion of South Asians (men=43.6%; women=50.4%) with high TG levels reported in the Manchester study was higher than the present study [12]. These findings indicate the lower prevalence of suboptimal TG level in the Jaffna population compared to other South Asian populations.

There are limitations in this study. As we analysed available data from a screening programme, it may not be a representative sample of the population. However, information derived from this analysis provides an understanding about the pattern of the dyslipidaemia in the local population which may help to plan future studies and interventions. Since we analysed

secondary data, information on patient characteristics was minimal. Therefore, we were not able determine the contributing factors for dyslipidaemia.

Conclusion

Prevalence of dyslipidaemia in Jaffna population was high and it was more prevalent among women than men. Like other Sri Lankan and South Asian populations, the most common dyslipidaemia was low HDL-C which also showed a female preponderancy. However, prevalence of high TG was lower in the Jaffna population than in other South Asian populations. Further studies focusing on the factors contributing to dyslipidaemia are needed to plan interventions to improve the lipid profile and lower CVD risk.

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Conflict of interest

None of the authors have any conflict of interest.

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CP 11

Intelligence quotient, working memory, and reaction time of secondary school students in Jaffna district and the influence of sociodemographic factors

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Abstract

Background and objectives: Intelligence quotient (IQ), working memory (WM), and reaction time (RT) are important cognitive abilities that influence career achievements. The objective of the study was to assess intelligence, working memory, and reaction time of secondary school students in Jaffna district and to determine their association with sociodemographic factors.

Methods: This analytical cross-sectional study was conducted among 765 students across five educational zones in Jaffna. The IQ and WM were assessed by Raven's Standard Progressive Matrices (RSPM) and Digit Span Backward Test (DSBT), respectively. The RTs were assessed by computer software developed locally. Independent sample t-test and one-way ANOVA were used for statistical analysis (significance level 0.05).

Results: The mean simple and choice RTs among students were 690.6±114.5s and 775.8±119.5s, respectively. The mean IQ assessed by RSPM was 47.9±7.4 and the mean DSBT score was 5.6±1.9. There were significant differences in RTs between males and females in simple (663.8s versus 718.5s, $p<0.001$) and choice (753.0s versus 799.6s, $p<0.001$) RTs with males having lower RTs than females. However, there were no significant differences in IQ and WM between males and females. Significant differences in all cognitive parameters were observed by educational zone, school, and parents' educational qualifications ($p\leq0.05$). Both IQ and WM displayed an increasing trend with increasing parental education. A strong positive correlation was observed between WM and IQ ($r=0.37$, $p<0.001$). Both simple and choice RTs had a weak negative correlation with IQ (simple $r=-0.19$, $p<0.001$; choice $r=-0.22$, $p<0.001$) .

Conclusions: Our findings are consistent with studies in other countries. Further research incorporating functional neuroimaging is required to establish the neurobiological basis of sex differences in cognitive abilities and the neurobiological relationship between IQ, WM, and RTs.

Keywords: Reaction times, Intelligent quotient, Working memory, Secondary school students