

## DYSLIPIDEMIA AMONG THE ELDERLY IN SLUMS OF WEST DELHI

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### ABSTRACT

**Objective:** The objective of this study is to assess the prevalence of dyslipidemia among the elderly in slums of West Delhi.

**Methods:** A cross-sectional study was carried out in slums of West Delhi covering a total of 234 elderly aged 60 and above. 5 ml blood was collected from 103 elderly and was analyzed for serum total cholesterol, triglyceride, high-density lipoprotein (HDL) cholesterol, and low-density lipoprotein (LDL) cholesterol by enzymatic method using fully automatic analyzer (Roche Hitachi-902). Dyslipidemia was defined using the National Cholesterol Education Program, ATP-III guidelines.

**Results:** The overall prevalence of high cholesterol ( $\geq 200$  mg/dl), high triglyceride ( $\geq 150$  mg/dl), low HDL cholesterol (male -  $< 40$  mg/dl; female -  $< 50$  mg/dl), and high LDL cholesterol ( $\geq 130$  mg/dl) was 20.39%, 45.63%, 64.08%, and 17.31%, respectively.

**Conclusion:** Low HDL cholesterol and high triglyceride were the most form of dyslipidemia among the elderly. Awareness on dietary and lifestyle modification for management of dyslipidemia needs to be imparted.

**Keywords:** Elderly, Dyslipidemia

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### INTRODUCTION

Cardiovascular disease (CVD) is one of the five global leading causes of total years of life lost in 2016 [1]. Dyslipidemia is a well-established risk factor of CVD amounting to more than half of the global cases of coronary artery disease [2,3]. Its prevalence has increased over a period of 20 years among the urban population in India [4]. Rapid urbanization, rural-to-urban migration, poor dietary habits, physical inactivity, sociocultural factors, and genetic predisposition all contribute to dyslipidemia [5]. The WHO Study on Global Aging and Adult Health carried out among 39,436 adults during 2007–2010 revealed that rural–urban migrants had a similar risk factor profile for non-communicable disease to the urban group, suggesting that exposure to urban environments may promote assimilation of health behavior regardless of previous life experiences [6]. This study was carried out to assess the prevalence of dyslipidemia among the elderly in slums of West Delhi.

### METHODS

A cross-sectional study was carried out in slums of West Delhi. A total of 234 elderly aged 60 and above were enrolled in the study with the help of local community leaders and paramedicals working in the area. 5 ml blood was drawn from 103 elderly and was analyzed for serum total cholesterol, triglyceride, high-density lipoprotein (HDL) cholesterol, and low-density lipoprotein (LDL) cholesterol by enzymatic method using fully automatic analyzer (Roche Hitachi-902). The biochemical analysis was done at the National Accreditation Board for Testing and Calibration Laboratories Accredited Laboratory, Centre for Promotion of Nutrition Research and Training, with a special focus on North-East, Tribal and Inaccessible Population (Indian Council of Medical Research), New Delhi. Internal and external quality control of analysis was maintained. The institutional ethical clearance was obtained. A written informed consent was taken from all the study volunteers.

Dyslipidemia was defined using the National Cholesterol Education Program, ATP-III guidelines [7].

### RESULTS

The overall mean of serum total cholesterol, triglyceride, HDL cholesterol, and LDL cholesterol is 68.86 mg/dl, 162.5 mg/dl, 43.89 mg/dl, and 105.6 mg/dl, respectively (Table 1). The mean level of all parameters was higher in female as compared to males.

The overall prevalence of high cholesterol ( $\geq 200$  mg/dl), high triglyceride ( $\geq 150$  mg/dl), low HDL cholesterol (male -  $< 40$  mg/dl; female -  $< 50$  mg/dl), and high LDL cholesterol ( $\geq 130$  mg/dl), respectively, was 20.39%, 45.63%, 64.08%, and 17.31% (Table 2). Prevalence of dyslipidemia was higher in females compared to male elderly.

### DISCUSSION

Our study indicated overall prevalence of high cholesterol ( $\geq 200$  mg/dl), high triglyceride ( $\geq 150$  mg/dl), low HDL cholesterol (male -  $< 40$  mg/dl; female -  $< 50$  mg/dl), and high LDL cholesterol ( $\geq 130$  mg/dl), respectively, as 20.39%, 45.63%, 64.08%, and 17.31%. A study carried out in Changsha, China, among 3500 persons aged 65 and over also reported high serum cholesterol, triglyceride, and LDL as 25.31%, 26.54%, and 16.65%, respectively [8]. Another study carried out among rural elderly in China reported the similar prevalence of high cholesterol (18.13%), while prevalence of high triglyceride (12.21%), low HDL cholesterol (32.76%), and high LDL cholesterol (13.23%) was lower compared to our findings [9]. Asian Indians have an abnormal fat distribution which makes it more prone to dyslipidemia [10].

Low HDL cholesterol was the most common among the elderly in our study. The Indian Council of Medical Research-India Diabetes

**Table 1: Mean±SD and median serum levels of total cholesterol, triglyceride, HDL cholesterol, and LDL cholesterol of elderly**

Parameters	N	All		N	Male		N	Female	
		Mean	Median		Mean	Median		Mean	Median
Total cholesterol (mg/dl)	103	68.86	171	56	162.11	163.74	47	176.89	179.29
Triglyceride (mg/dl)	103	162.5	143.0	56	144.81	116.15	47	183.70	171.20
HDL (mg/dl)	103	43.89	39.51	56	41.9	41.1	47	46.23	38.15
LDL (mg/dl)	52	105.60	109.00	21	96.05	98.00	31	112.06	113.00

HDL: High-density lipoprotein, LDL: Low-density lipoprotein

**Table 2: Prevalence of dyslipidemia in the elderly**

Parameters	N	All		N	Male		N	Female	
		N (%)	N (%)		N (%)	N (%)			
Total cholesterol (≥200 mg/dl)	103	21 (20.39)		56	9 (16.07)		47	12 (25.53)	
Triglycerides (≥150 mg/dl)	103	47 (45.63)		56	19 (33.93)		47	28 (59.57)	
HDL-cholesterol (M - <40 mg/dl; F - <50 mg/dl)	103	66 (64.08)		56	27 (48.21)		47	39 (82.98)	
LDL-cholesterol (≥130 mg/dl)	52	9 (17.31)		21	2 (9.52)		31	7 (22.58)	

HDL: High-density lipoprotein, LDL: Low-density lipoprotein

study carried out among adults in Tamil Nadu, Maharashtra, Jharkhand, and Chandigarh also reported the prevalence of low HDL cholesterol (72.3%) as the most common dyslipidemia compared to hypercholesterolemia (13.9%), hypertriglyceridemia (29.5%), and high LDL cholesterol (11.8%) [11]. A recent survey of the National Nutrition Monitoring Bureau Survey carried out by the Indian Council of Medical Research in urban areas indicated that more than 20% of adults had total cholesterol ≥200 mg/dl and LDL cholesterol ≥130 mg/dl, while around 40% of men and 28% of women had triglycerides ≥150 mg/dl and about 74% of men and 82% of women had low HDL cholesterol <40/50 mg/dl [12].

The concentration of cholesterol increases until 45–55 years of age in men, while for women, it continues increasing and only declines in the last decade of life [13]. A cross-sectional study carried out among 5375 adults in China also revealed peak prevalence of dyslipidemia in men between 30 and 39 years with a gradual decline as age increases, while in women, the prevalence of dyslipidemia increased with age and peak prevalence occurs after the age of 60 [14]. Menopause leads to changes in hormonal status and lipid profile in women by resulting in increased total and LDL cholesterol and reduced HDL cholesterol [15]. Our study also revealed a higher prevalence of dyslipidemia among elderly female compared to male. A study carried out among in rural Thailand also reported that women had significantly higher cholesterol and LDL cholesterol levels than men [16].

#### CONCLUSION

Low HDL cholesterol and high triglyceride were the most form of dyslipidemia among the elderly. Awareness on dietary and lifestyle modification for management of dyslipidemia needs to be imparted.

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#### AUTHORS CONTRIBUTIONS

- \*Zaozianlungliu Gonmei: Data collection, data analysis, interpretation of data, and paper writing
- \*Supriya Dwivedi: Data collection, data analysis, interpretation of data, and paper writing
- Dr. Gurudayal Singh Toteja: Conceptualization of study, interpretation of data, and finalization of manuscript
- Dr. Karuna Singh: Conceptualization of study and interpretation of data

- Dr. Naval Kishore Vikram: Conceptualization of study and interpretation of data
- Dr. Priyanka Gupta Bansal: Conceptualization of study and interpretation of data
- Suman Rathore: Interpretation of data.

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#### CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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