

Prevalence of Diabetes & Hypertension: A Health Screening Programme in Rural Sri Lanka

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Abstract

Introduction:

Previous studies have indicated that diabetes mellitus was less prevalent in rural regions compared to metropolitan areas. However, recent data revealed significant increases in the prevalence of diabetes mellitus in rural areas as well. This study aimed to describe prevalence of diabetes and hypertension among adults attending health screening programmes at Rural Health Research Centre in Kataragama.

Methods:

A cross-sectional study was conducted in conjunction with health screening programmes on World Diabetes Day and World Hypertension Day in 2023 at the Rural Health Research Centre in Kataragama. Adult residents (aged >18 years) of the Kataragama Medical Officer of Health area were invited to participate in these health screenings. Medical officers evaluated all participants for diabetes and hypertension. Anthropometric measurements and blood pressure assessments were conducted, and blood samples were collected for fasting plasma glucose (FPG) and serum Creatinine tests. Diabetes diagnoses were made according to the latest guidelines from the American Diabetes Association, while hypertension was assessed following the criteria set by the American Heart Association. Categorical associations were analyzed using the Chi-square test with SPSS software.

Results:

A total of 170 individuals (mean age of 49.3(±13.2), females -70.1%) participated in the clinics. Mean FPG was 110.4 mg/dl (±24.2), BMI was 26.02 kg/m² (± 5.6) and serum creatinine value 0.83mg/dl(±0.3). The prevalence were as follows: overweight - 45.5%, obesity - 31.7%, diabetes - 17.9%, pre-diabetes - 29.3%, elevated hypertension-18.6%, stage I hypertension-31.1% and stage II hypertension-14.4%. Significant association was found between hypertension stages and advancing age groups (p=0.038) and with sex categories (p=0.036). Among the overweight participants, 11.1% were in stage I and 25% in stage II hypertension, while 29.0% and 23.7% of obese groups had hypertension I and II respectively.

Conclusion:

Prevalence of diabetes and hypertension were high in this rural community. Health promotional camps can be effectively used to detect the undiagnosed cases.

Keywords: Diabetes, Hypertension, non-communicable diseases, prevalence, rural setting,

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Introduction

Non-communicable diseases are currently exceedingly prevalent globally and are the leading cause of death. Cardiovascular diseases account for most non-communicable diseases deaths, followed by cancers, chronic respiratory diseases, and diabetes. As estimated by the international diabetes federation (2021), prevalence of diabetes in rural areas were 8.3% and in low-and middle-income countries it is 5.5% [1]. American College of Cardiology (2022) stated that hypertension is also prevalent among the poorest people in low-and middle-income countries [2]. Currently, Sri Lanka is in a rising trend of non-communicable diseases. Although, the increased prevalence was common in urban settings for some time, significant increases are now being observed in rural areas as well [3, 4]. Ageing and lifestyle modifications have been recognized as contributors towards it. Further, the farming occupations have significantly contributed towards the chronic kidney disease with unknown etiology, a major public health concern in last two decades. Therefore, we aimed to describe prevalence of diabetes and hypertension, in a rural community at Kataragama medical officer of health area.

Methods

A health screening programme was conducted parallel to World Hypertension Day 2023. The adult (≥ 18 years) permanent residents of the Kataragama Medical Officer of Health area were invited to participate in a programme at the Rural Health Research Centre of the Faculty of Medicine, University of Colombo, located in Kataragama. Participants were screened and obtained their past medical history by the Medical officers, anthropometric measurements and blood pressure assessments were conducted. Blood samples were collected for serum creatinine and fasting plasma glucose. Hypertension was diagnosed as the guidelines of the American Heart Association [5], diabetes as the American Diabetes Association criteria [6], and the classification of standard weights as WHO Asian body mass index risk cut points [7]. Associations were tested using Chi-square test. P-value < 0.05 was considered as significant.

Results

A total of 170 individuals (mean age of $49.3(\pm 13.2)$, females -70.1%) participated in the programmes. Mean FPG was $110.4\text{mg/dl}(\pm 24.2)$, BMI was $26.02\text{ kg/m}^2(\pm 5.6)$ and serum creatinine value $0.83\text{mg/dl}(\pm 0.3)$. Of the sample, 45.5% were as overweight, 31.7% was obese, 17.9% was diabetes, 29.3% were pre-diabetes, 18.6% had elevated hypertension, 31.1% had stage I hypertension and 14.4% had stage II hypertension. Only 4% were having estimated glomerular filtration rate less than 60 ml/min/1.73m^2 . Significant association was found between hypertension stages and advancing age groups ($p = 0.038$) and with sex categories ($p = 0.036$). Among the overweight participants, 25.0% were in stage I and 14.5% in stage II hypertension, while 47.2% and 13.2% of obese groups had hypertension I and II respectively. Table 1 presents the distribution of participants by age and non-communicable diseases status.

Table 1: Distribution of participants according to age, sex, body mass index and selected non-communicable disease parameters

Characteristic	Percentage
Age group	
<35 years	9%
35-59 years	75%
≥ 60 years	16%
Sex	
Female	70%
Male	30%
Body Mass Index category	
Under weight ($< 18.5\text{kg/m}^2$)	5%
Normal ($18.5\text{-}22.95\text{kg/m}^2$)	18%
Over weight ($23.0\text{-}27.49\text{kg/m}^2$)	45%
Obese ($\geq 27.55\text{kg/m}^2$)	32%
Fasting Plasma Glucose level	
Normoglycemic	53%
Pre-diabetes	29%
Diabetes	18%
Hypertension category	
Normal	36%
High-normal	19%
Grade I hypertension	31%
Grade II hypertension	14%
Estimated Glomerular Filtration Rate	
< 30	4%
30-60	0
60-90	32%
≥ 90	64%

Discussion

Hypertension and diabetes mellitus are increasingly prevalent conditions in low- and middle-income countries, significantly raising the risk of mortality and morbidity among affected individuals. In this rural community, we observed a notable prevalence of both diabetes and hypertension. Notably, men exhibited higher risks for prediabetes/diabetes and elevated/stage I hypertension compared to women. Furthermore, older participants showed a greater incidence of chronic kidney disease. Identifying individuals in the pre-clinical stages through screening provides an opportunity for both participants and healthcare providers to modify long-term risk before serious complications, such as chronic kidney disease, develop. However, it is important to note that literature on community-based screening studies for hypertension and diabetes mellitus in rural Sri Lanka is limited.

The data collected in this screening programme provides a reflection of the status of hypertension and diabetes in this community. A significant proportion of adults was pre-diabetes (29.3%) or diabetes (17.9%). This could be due to the fact that those who volunteered to participate the programme are high risk group of non-communicable diseases. Surveys conducted in the past in different rural settings provided varying prevalence. The prevalence of diabetes in Jaffna district was 16.4% in 2015 [3], prevalence in the Uva province was 6.3% in males and 6.8% in females in 2004 [8], 6.8% in 2006 [9], and 16.3% in 2018 [4]. Diabetes prevalence was 4.8% in a Chinese rural setting [10] and 14.6% in rural India with high altitude [11]. A rural low-income setting of Kenya presented 8% with random glucose of $\geq 7\text{mmol/L}$ [12]. In our programmes, more than half of the participants were having high blood pressure levels, 18.6% were high normal, 31.1% were grade I hypertension and 14.4% were grade II hypertension. The studies done on assessing prevalence of hypertension in

rural Sri Lanka presented varying rates. In Anuradhapura, the prevalence was 26.3%^[13], in Uva province it was 21.2% in males and 24.6% in females^[8], and in Puttalam it was 37.0%^[14]. The Indian high-altitude study also showed similar rates (54.5%)^[11]. In contrast the it was low as 10% in Kenyan rural setting^[12]. As estimated by Kafele et al., (2019), prevalence of households with having at least one member with chronic kidney disease in Monaragala district was of 9.7%^[15]. According to the findings of our programmes, only 4% were having estimated glomerular filtration rate less than 60ml/min/1.73m² and only 1% of them had grade II hypertension level. This low rate may be due to the low number of sample size. Findings of these high prevalence in non-communicable diseases in rural areas is important as these residents have lesser access to appropriate care and management and also it can be assumed that their attitudes towards management is poor.

Conclusion

Prevalence of diabetes and hypertension were high in this rural community. Risk for prediabetes/diabetes was higher in men than women, and chronic kidney disease increases with age. This kind of rural health screening programmes should be conducted in other rural settings to identify the undiagnosed cases.

Declaration

Conflict of Interests: None

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