

## Original Research Article

# Burden of diabetes and hypertension among people attending health camps in an urban area of Kancheepuram district

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## ABSTRACT

**Background:** Diabetes and hypertension are among the most common non-communicable diseases affecting our population. They are the important risk factors for cardiovascular morbidity and mortality. The aims and objectives of the study were to determine the burden of diabetes and hypertension among people attending health camps in an urban area of Kancheepuram district. Formulation of suitable preventive measures based on the inferences from the study.

**Methods:** A cross-sectional record based study was done on 825 people attending medical camps conducted by Sree Balaji Medical College & Hospital, in Anakaputhur area of Kancheepuram district. The data regarding Random Blood Sugar (RBS) level, blood pressure level, age, and gender were collected from the camp register (January and February, 2017). A random blood sugar (RBS) value of >200 mg/dl in a patient with classic symptoms of hyperglycaemia or hyperglycaemic crisis was defined as having diabetes. Blood pressure level equal to or greater than 140/90mm Hg was defined as having hypertension. Descriptive analysis and Chi square test was done to see the statistical association between various parameters.

**Results:** Of the total study population of 825 people, 215 were males and 610 were females. The overall burden of diabetes and hypertension among the study population was 10.7% and 6.4% respectively. Co-existence of both diabetes and hypertension was seen in 5.7% of people.

**Conclusions:** To reduce the disease burden due to diabetes and hypertension, primary prevention measures such as health education regarding adoption of healthy lifestyle should be instituted. Interventions such as screening and early initiation of treatment should also be made for controlling the diseases and preventing its complications.

**Keywords:** Diabetes, Hypertension, Random blood sugar, Disease Burden, Screening

## INTRODUCTION

Prevalence of diabetes has increased exponentially throughout the world from 108 million in 1980 to 422 million in 2014.<sup>1</sup> Throughout the world, the diabetic prevalence among adults over 18 years of age has increased rapidly from 4.7% in 1980 to 8.5% in 2014.<sup>1</sup> The middle and low income countries are worst affected by diabetes owing to its rapid rise in prevalence in the

recent past.<sup>1</sup> Diabetes is an important cause of blindness(diabetic retinopathy), chronic kidney disease, myocardial infarction, cerebrovascular accident and amputation of lower limbs.<sup>1</sup> Diabetes has caused an estimated death of 1.5 million people directly, while higher-than-optimal blood glucose caused an additional 2.2 million deaths in the year 2012 by increasing the risks of cardiovascular and other diseases.<sup>1</sup> An estimated 7.5 million deaths were caused by hypertension throughout the world, which contributes to about 12.8% of the total

deaths.<sup>2</sup> Hypertension is an important risk factor for coronary heart disease and stroke. Other complications of raised blood pressure are cardiac failure, peripheral vascular disease, hypertensive nephropathy, hypertensive retinopathy causing visual impairment. From the year 1980 to 2008 the number of people with uncontrolled hypertension has increased from 600 million to 1 billion due to the growth and ageing of the population.<sup>2</sup> Diabetes and hypertension are among the most common non-communicable diseases affecting our population. India has become the “Diabetes Capital of the World” with more than 62 million individuals (as of 2014) diagnosed with diabetes.<sup>3</sup> According to National Family Health Survey-4 (2015-2016) the prevalence of hypertension among adults was 22.4% (men-13.6% and women-8.8%). Hypertension is the major cause of stroke in India contributing to about 57% of all the deaths due to stroke. Hypertension is an important risk factor for coronary heart disease contributing to 24% of all deaths due to coronary heart disease in India.<sup>4</sup> WHO rates hypertension as one of the most important causes of premature death worldwide.<sup>5</sup> Diabetes and hypertension contributes to significant morbidity and mortality in India.<sup>6</sup> Hence this study was undertaken with the objective of determining the burden of diabetes and hypertension among people attending health camps in an urban area of Kancheepuram district and subsequent formulation of suitable preventive measures based on the inferences from the study.

## METHODS

A cross-sectional record based study was done on patients who had attended medical camps conducted by Urban Health and Training Centre of Sree Balaji Medical College and Hospital in the Anakaputhur area of Kancheepuram district between January and February 2017. Data was collected retrospectively from the records, for the month of January and February 2017 and a sample size of 825 was obtained. Study subjects included in this study were above 18 years of age and all pregnant women were excluded. Apart from the known cases of diabetes mellitus who were under treatment for the same, new cases of diabetes mellitus were diagnosed

according to American Diabetic Association guidelines which states that random blood sugar (RBS) value of >200 mg/dl in a patient presenting with classic symptoms of hyperglycaemia or hyperglycaemic crisis was defined as having diabetes.<sup>7</sup>

## Diagnostic criteria for hypertension

Measurement of blood pressure was done as per Joint National Committee (JNC)-7 guidelines using the standard protocol.<sup>8</sup> Patients were seated quietly for at least 5 minutes in a chair, with feet on the floor, and arm supported at heart level prior to the measurement of blood pressure. Blood pressure was measured using a standard mercury sphygmomanometer. Two readings separated by a time gap of 2 minutes were taken and the values were averaged. If the first two readings differed by more than 5 mm Hg, additional reading was obtained and averaged. Hypertensive subjects were defined as those with systolic blood pressure (SBP) equal to or more than 140 mmHg and/or diastolic blood pressure (DBP) equal to or more than 90 mmHg or those being treated for hypertension.<sup>8</sup>

Data entry was done in Microsoft excel and statistical analysis was carried out in SPSS 22. Descriptive statistical analysis was done using the percentage & proportions and statistical association was calculated using the Chi-square test and p value estimation.

## RESULTS

Of the total study population of 825 people, 215 were males and 610 were females. The overall burden of diabetes and hypertension among the study population was 10.7% and 6.4% respectively. 5.7% of people had co-existence of both diabetes and hypertension (Figure 1). There is a significant statistical association between increasing age and occurrence of diabetes and hypertension (Table 1). The burden of diabetes among males were high 14.4% when compared to females 9.3%. Similarly the co-existence of diabetes and hypertension among males were found to be high 7.6% when compared to females 5% (Table 2).

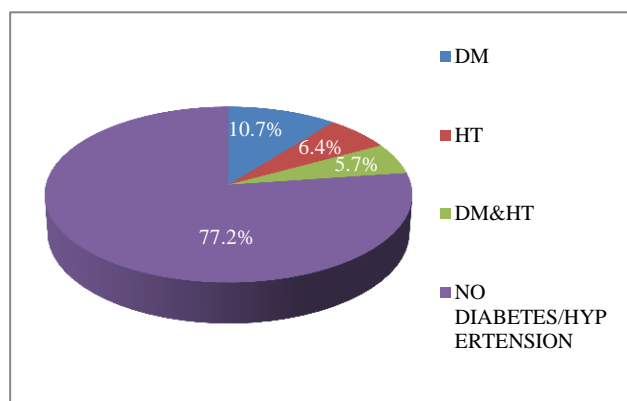
**Table 1: Stratification of diagnosis according to age.**

Age (years)	Diagnosis				Total
	Diabetes (DM)	Hypertension (HT)	DM and HT	No diabetes/hypertension	
<b>18-39</b>	12 (4.4)	5 (2)	7 (2.6)	244 (91)	268
<b>&gt;40</b>	76 (13.6)	48 (8.6)	40 (7.1)	393 (70.7)	557
<b>Total</b>	88	53	47	637	825

P value =0.0001; statistically significant with df = 3.

**Table 2: Stratification of diagnosis according to sex.**

Sex	Diagnosis				Total
	Diabetes (DM)	Hypertension (HT)	DM and HT	No diabetes/hypertension	
<b>Male</b>	31 (14.4)	13 (6)	16 (7.6)	155 (72)	215
<b>Female</b>	57 (9.3)	40 (6.7)	31 (5)	482 (79)	610
<b>Total</b>	88	53	47	637	825



**Figure 1: Frequency distribution of diseases.**

## DISCUSSION

In this study, the burden of diabetes among camp patients (10.7%) was comparable to the findings of the study done by Anusuya et al in the year 2015 which showed the overall prevalence of diabetes among patients attending medical camps in various parts of South Chennai to be 11.8%.<sup>9</sup>

In this study, the burden of hypertension among camp patients was 6.4% which was low when compared to the findings of the study done by Kannan and Satyamoorthy in the year 2009 which showed the prevalence of hypertension in a rural area of Kancheepuram district to be 25.2%.<sup>10</sup> The low burden of hypertension in our study could be due to the fact the study involved adults in the age group 18 years and above whereas the study conducted by Kannan and Satyamoorthy involved adults in the age group 30 years and above. It could be also due the fact that this study involved only the camp patients whereas the study done by Kannan and Satyamoorthy was a community based cross-sectional study.<sup>10</sup>

### Limitations of this study

Firstly, the present study involved only the patients attending health camps in Anakaputhur area, hence the findings of the study cannot be extrapolated to general population. Secondly, the diagnostic criteria for diabetes is based only on the measurement of random blood glucose level ( $>200$  mg/dl) by glucometer in patients presenting with classic symptoms of hyperglycaemia, which by itself is not fully sufficient for diagnosis of diabetes. It can be effectively used as a screening test but further follow up testing should be done for confirmatory diagnosis of diabetes, which may be done by measurement of Fasting blood glucose level or by measuring 2-hr postprandial glucose level during an oral glucose tolerance test (OGTT) or by measuring HbA1C level. Thirdly the study population in the present study included only the adults aged above 18 years, thereby effectively excluding the children with type-I diabetes and paediatric hypertension. Another limitation of this

study is that its sample size is small, therefore the findings of this study cannot be extrapolated to the whole population.

## CONCLUSION

To reduce the disease burden due to diabetes and hypertension health education should be given for creating awareness about lifestyle diseases like hypertension and diabetes among the general public even from a young age. Since the prevalence of both hypertension and diabetes increases after forty years of age, screening programmes should be initiated for early detection of these two diseases. Early initiation of treatment for both the diseases could lead to their effective control and prevention of future complications. Diabetic patients should be advised about proper self care which includes foot care, proper (self) insulin administration technique, periodic check-ups, home glucose monitoring, adherence to diet and medications and annual eye examination to rule out diabetic retinopathy. In hypertensive patients with diabetes, the goal of anti-hypertensive therapy is to maintain blood pressure level less than 130/80 mmHg to prevent both microvascular and macrovascular complications.

### Recommendation

Further community based studies should be carried out in different areas of Kancheepuram district to obtain and validate the prevalence data of diabetes and hypertension.

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

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