



ROLE OF ROUTINE HEALTH CHECKUPS IN DETECTING NEW CASES OF CHRONIC ILLNESSES IN A TERTIARY CARE CENTER

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ABSTRACT

Background: Routine health checkups are done in a tertiary care centre in Chennai for those coming with health seeking behavior and for obtaining medical certificates. Thus the current study was conducted to assess the health status of these individuals attending the routine health checkup unit to detect new cases of chronic illnesses like diabetes mellitus, hypertension and dyslipidemia among individuals attending a tertiary care hospital.

Methods: A hospital data based study was conducted among the individuals attending master health checkup in a tertiary care center, in Chennai during the period March 2019 to August 2019. A total of 204 participants were included in this study. The data included Fasting blood sugar, Post Prandial blood sugar, blood pressure measurements, HbA1c levels and fasting lipid profile and analysis was done using Statistical Package for Social Sciences (SPSS) version 20.

Results: Routine health checkup picked new cases of diabetes mellitus and hypertension in the proportion of 11.5% and 27.2%, respectively, among the non diabetic and non hypertensive

cases. Also among the non dyslipidemic cases, routine health checkups help to find 36.6%, 33.5% and 33.5% of cases with elevated triglycerides, low HDL and high LDL, respectively. The association between history of Diabetes Mellitus and Hypertension was found to be significantly associated with findings of routine health checkups whereas the triglycerides, HDL and LDL were not significantly associated.

Conclusion: People can be encouraged to utilize routine health checkups for early detection of disease and to adopt timely interventions.

Keywords: Routine Health checkups, diabetes mellitus, hypertension, dyslipidemia

INTRODUCTION

The burden of the Non-Communicable Diseases (NCD), especially type 2 diabetes mellitus, hypertension, dyslipidemia which eventually leads to cardiovascular diseases and stroke, shows a constant and steady rise in the developing countries, particularly in Southeast Asian region (SEAR) [1].

With the increasing burden of chronic NCDs in India, it was predicted that by 2030 India's diabetic population would be nearly 87 million [2]. Similarly, the prevalence of hypertension has increased from 16% in 2004 to 32.6% in 2008 [3].

Several factors contribute to the increasing burden of disease like lifestyle pattern, food habits, ethnicity, genetic and hereditary components, etc. Similar to the contributing factors, identifying the cases of NCDs are really challenging even in this 21st Century. In the recent decade, the people utilizing the routine health checkups are slowly picking up.

Routine health checkups are periodic health checkup done in almost all the tertiary health care centers in India. It plays a very important role in detecting and identifying the diseases or its warning signs at an early stage of the disease. This helps patients and the health care providers in terms of making the treatment more effective, less expensive and less invasive.

The main aim of routine health checkups are to reduce morbidity and mortality by detecting disease at an earlier stage or by identifying the modifiable risk factors of a disease in order to improve clinical outcomes compared with waiting until symptoms develop [4].

Though the routine health checkups play a very crucial role in detecting the chronic illness, the existing knowledge has conflicting outcomes. Studies conducted by Jareno *et al* [5], Friedman *et al* [6] and Sheridan *et al* [7] reported that screening for

multiple diseases at once was beneficial both in the long and short run, substantially reducing mortality and worry from patients. But other studies conducted by Bender *et al* [8], Theobald *et al* [9] and Norris *et al* [10] found that there was no substantial gain from such screening.

An Indian study conducted by Ramachandran A *et al* [11] found that the prevalence of diabetes is high in urban India and there is a large pool of subjects with impaired glucose tolerance at a high risk of conversion to diabetes. Thus, this study was conducted to assess the effectiveness of routine health checkup in diagnosing newer cases with chronic illnesses.

Objectives

To assess the effectiveness of routine health checkup unit in picking up the new cases of chronic illnesses like diabetes mellitus, hypertension and dyslipidemia among individuals attending a tertiary care hospital.

MATERIALS AND METHODS

Study Design: Record based Cross sectional study

Study Area: Master Health Check up (MHC) unit, General Medicine Department, Sree Balaji Medical College and Hospital, (SBMCH), Chennai

Study Population: The individuals attending Master Health Check up unit in

Sree Balaji Medical College and Hospital (SBMC & H), a tertiary care center, in Chennai

Study Method:

The current study was conducted using the data collected routinely in the Master Health Check up unit. On regular basis in MHC, data entry is done using Microsoft excel covering particulars related to past known chronic illness like diabetes mellitus, hypertension and dyslipidemia. Routinely general and systemic examinations are done. Venous blood samples are collected from all the individuals and assessed for fasting blood sugars (FBS) and post prandial blood sugars (PPBS), HbA1c levels, lipid profile including total cholesterol (TC), Triglycerides (TGL), High density lipoprotein (HDL) and Low density lipoprotein (LDL), renal and liver function tests and complete blood count with peripheral blood smears. Urine routine, chest X-ray, ECG and Ultra Sound abdomen are also done. Data collected during the month of March 2019 to August 2019 was analysed for the current study. Retrospective data analysis was done using Statistical Package for Social Sciences (SPSS) version 20 and descriptive statistics and chi square test was done to assess the association between parameters. P value of < 0.05 was considered as statistically significant.

Study Sample: 204

According to a reference study [12], relating to prevalence of diabetes mellitus among individuals attending a tertiary care hospital, sample size was calculated. A total of 204 participants who attended routine health care unit during the study period were included in the study.

RESULTS

The current study was conducted to find out the health status of individuals attended Master Health Check up unit in Sree Balaji Medical College and Hospital (SBMC&H). Among the 204 study participants 27.5%, 15.2% and 4.9% of the participants gave known history of chronic illnesses like diabetes mellitus, hypertension and dyslipidemia, respectively (**Table 1**).

Apart from the known history given by the patients, on assessing the fasting lipid profile in the MHC unit, triglycerides levels were found to be 150 mg/dl, 151-300mg/dl and more than 300 mg/dl among 61.7%, 34.8% and 3.4% of participants, respectively.

Similarly HDL was < 40 mg/dl among 32.8% of participants and \geq 40 mg/dl among 67.2% of participants. On assessing the LDL levels, 29.4%, 36.8% and 33.8% of the participants had LDL levels of <100 mg/dl, 100-130 mg/dl and > 130 mg/dl, respectively (**Table 2**).

In the current study, HbA1C not being available in many patients we used only FBS cut off at >125mg/dL and PPBS cut off at >160 mg /dL. By these criteria, among the known cases of diabetes mellitus (N=56) FBS and PPBS were normal among 26.8% of participants and elevated among 73.2% of participants. Among the participants who were not a known case of diabetes mellitus, 17(11.5%) participants were found to have elevated FBS and PPBS levels. This difference among the known diabetes and newly diagnosed diabetes cases by routine health checkup were found to be statistically significant ($p = 0.000$). Similarly, among the known cases of hypertension (N=31) blood pressure levels were normal among 38.7% of participants and elevated among 61.3% of participants. Among the participants who were not a known case of hypertension, 47 (27.2%) participants were found to have elevated blood pressure levels. This difference among the known hypertensive cases and newly diagnosed hypertensive cases by routine health checkup were found to be statistically significant.($p = 0.0001$) (**Table 3**).

On assessing the association between diabetes mellitus and hypertension, 17 participants were found to have both diabetes mellitus and hypertension and 14 participants

had hypertension alone and 39 participants had diabetes mellitus alone and 134 participants were reported to be free from both hypertension and diabetes mellitus. The association between diabetes mellitus and hypertension was found to be statistically significant ($p=0.000$) (**Table 4**).

In the present study, based on history 10 (4.9%) were found to have dyslipidemia. Among the non dyslipidemic participants, on assessing the triglycerides level it was found that 71 (36.6%) participants had abnormal levels (>150 mg/dl). On assessing HDL 65 (33.5% of participants had low HDL (< 40

mg/dl). Similarly high levels of LDL were reported among 65 (33.5%) participants. There was no statistically significant association found among the above mentioned parameters (**Table 5**).

Thus routine health checkup picked new cases of diabetes mellitus and hypertension in the proportion of 11.5% and 27.2%, respectively, among the non diabetic and non hypertensive cases. Also among the non dyslipidemic cases, routine health checkups help to find 36.6%, 33.5% and 33.5% of cases with elevated triglycerides, low HDL and high LDL, respectively.

Table 1: Proportion of cases with different chronic illnesses based on history

Chronic illnesses	Frequency	Percent
Type 2 Diabetes mellitus		
Yes	56	27.5
No	148	72.5
Hypertension		
Yes	31	15.2
No	173	84.8
Dyslipidemia		
Yes	10	4.9
No	194	95.1

Table 2: Lipid profile of the study participants in Master Health Checkup

Variables	Frequency	Percent
Triglycerides		
≤ 150 mg/dl	126	61.7
151 -300 mg/dl	71	34.8
>300 mg/dl	7	3.4
HDL		
< 40 mg/dl	67	32.8
≥ 40 mg/dl	137	67.2
LDL		
<100 mg/dl	60	29.4
100 -130 mg/dl	75	36.8
>130 mg/dl	69	33.8

Table 3: Association between DM, HTN – Based on history and MHC findings

Diabetes mellitus - Based on history	Findings of Routine health checkups		Total	P value
	Normal blood sugars	Elevated blood sugars		
Yes	15 (26.8)	41 (73.2)	56 (100)	0.000*
No	131 (88.5)	17 (11.5)	148 (100)	
Hypertension - Based on history	Findings of Routine health checkups		Total	P value
	Normal blood pressure	Elevated blood pressure		
Yes	12 (38.7)	19 (61.3)	31 (100)	0.0001*
No	126 (72.8)	47 (27.2)	173 (100)	

*Significant

Table 4: Association between diabetes mellitus and Hypertension based on history

Diabetes mellitus	Hypertension		Total	P value
	Yes	No		
Yes	17 (30.4)	39 (69.6)	56 (100)	0.000*
No	14 (9.5)	134 (90.5)	148 (100)	

*Significant

Table 5: Association between Lipid profile – Based on history and MHC findings

Based on history	Based on MHC findings			Total	P value
Triglycerides (mg/dl)	≤ 150	151 -300	>300		
Yes	3 (30)	6 (60)	1 (10)	10 (100)	0.084
No	123 (63.4)	65 (33.5)	6 (3.1)	194 (100)	
HDL (mg/dl)	< 40	≥ 40	-	Total	P value
Yes	2 (20)	8 (80)	-	10 (100)	0.375
No	65 (33.5)	129 (66.5)	-	194 (100)	
LDL (mg/dl)	<100	100 -130	>130	Total	P value
Yes	3 (30)	3 (30)	4 (40)	10 (100)	0.882
No	57 (29.4)	72 (37.1)	65 (33.5)	194 (100)	

DISCUSSION

Routine health check-up is widely adopted by for the betterment of their people's health [13]. But the degree of its utility in early detection of disease states remains speculative [14, 15]. Hence, there is uncertainty among the public and health care professionals in utilizing these preventive health care services in a beneficial, judicious, as well as cost effective manner [14, 15].

In this study 204 participants, who utilized routine health checkup during the study period were included. Among them 27.5%,

15.2% and 4.9% of the participants had history of chronic illnesses like diabetes mellitus, hypertension and dyslipidemia, respectively.

Apart from the known history given by the patients, on assessing the fasting lipid profile in the master health checkup, triglycerides were found to be normal, 151-300mg/dl and more than 300 mg/dl among 61.7%, 34.8% and 3.4% of participants, respectively.

In the current study, using our criteria as defined earlier, among the known cases of diabetes mellitus (N=56) FBS and PPBS

were normal among 26.8% of participants and elevated among 73.2% of participants. Among the participants who were not a known case of diabetes mellitus, 17 participants were found to have elevated FBS and PPBS levels. This difference among the known diabetes and newly diagnosed diabetes cases by routine health checkup were found to be statistically significant ($p = 0.000$). Similarly, among the known cases of hypertension ($N=31$) blood pressure levels were normal among 38.7% of participants and elevated among 61.3% of participants. Among the participants who were not a known case of hypertension, 47 (27.2%) participants were found to have elevated blood pressure levels. This difference among the known diabetes and newly diagnosed hypertensive cases by routine health checkup were found to be statistically significant.

In the present study, based on history 10 (4.9%) were found to have dyslipidemia. Among the non dyslipidemic participants, on assessing the triglycerides level it was found that 71 (36.6%) participants had abnormal levels. On assessing HDL levels, 33.5% of participants had low HDL. Similarly high levels of LDL were reported among 33.5% participants. There was no statistically significant association found among the above mentioned parameters.

Ramesh *et al* [16] reported that 12.8% had diabetic range of blood sugar values and 21.7% had BP in the hypertensive range, in their study. Also they reported that dyslipidemia was detected in 89.2% of asymptomatic individuals.

Venugopal *et al* [17] reported the prevalence of hypertension in 25.6% of patients. Also 52.4%, 18%, 7.6% of patients were prehypertensive, stage-1 hypertension and stage-2 hypertension, respectively. They reported macrovascular and microvascular complications in 48% and 24% of patients, respectively.

CONCLUSION

Based on the results of the current study it is evident that a significant number of disease states were newly identified by routine health checkup unit. Also it was observed that those who were known cases of diabetes mellitus, hypertension and dyslipidemia were found to have uncontrolled diseases. This reveals that our clientele need to be much more concerned about their disease states and be strongly encouraged on health seeking behavior, which will part form of the next stage of our Master Health Unit strategy . People should be encouraged to utilize routine health services at a regular interval for routine screening, early detection of disease and to adopt timely interventions that

are needed to prevent the disease's complications.

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Declarations

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