Study of Risk Factors and Compliance in Patients Attending NCD clinic at CHC, Gandhinagar, Bhopal

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ABSTRACT

Introduction: Non Communicable diseases (NCDs) are the leading causes of death globally, killing more people each year than all other causes combined. There is an utmost need for Non communicable disease control measures in every corner of the country in view of high and increasing prevalence of NCDs in all strata of society. In view of this need an NCD clinic was started by the Department of Community medicine at CHC Gandhinagar where patients with CAD, hypertension and diabetes are registered. They are given appropriate drug treatment and advise on prevention and management of their disease and risk factors. Objectives of the research were to study the self reported compliance of patients to treatment, diet and lifestyle habits before and 6 months after registration at the clinic and to study the risk factors of NCDs among the registered patients.

Material and Methods: Study variables were recorded form the predesigned proforma already used at the NCD clinic for recording history, physical examination, risk factors and follow up.

Results: Nearly all patients were from poor socio-economic background and were mostly illiterate. 2/3rd were females. The compliance to treatment prior to registration was very poor with unhealthy diet and lifestyle which significantly improved after frequent follow up. 68.9% had high BMI, 63.8% had high waist circumference, 39.6% used tobacco. There was 17.3% increase in salad intake and 14.6% decrease in Tobacco use. Both BMI and waist circumference were correlating without any significance difference in hypertensive as well as diabetics. 25 ((21.5%) were found to have clinically evident CAD.

Conclusion: The NCD clinic drastically improved treatment compliance and brought about a favourable change in the diet and lifestyle of the patients. NCD clinics should be establish at the PHC level all over the country

Keywords: Non Communicable diseases (NCDs), PHC

INTRODUCTION

Non Communicable diseases (NCDs) have become an important cause of morbidity and mortality worldwide. The mortality due to NCDs has become higher than all other causes taken together.[1] In 2008, almost two-third of the deaths in the world were due to NCDs which mainly includes cardiovascular diseases, diabetes, cancers and chronic lung diseases.[1] Developing countries account for 80% of these deaths[2]

NCDs particularly cardiovascular diseases (CVDs) are occurring at a younger age because of rapid urbanization. Consequently they disrupt the families socially as well as financially. They increase the health care cost and cause a huge socio-economic burden to the entire nation because treatment of these diseases is costly. NCDs are affecting all strata of society including the middle class and underpriv-ileged section which form the majority of the population. They have less understanding and knowledge of the measures to prevent them. They are more exposed to the use of tobacco and use of protective foods like fruits, vegetables and dry fruits (nuts) is lower among them. They are not able to afford the cost of treatment of CVDs and consequently have a higher mortality at a relatively younger age compared to well to do section of the society. Many families in India go below poverty line because of health care cost. NCDs have been projected to cause a loss of 237 billion to India during 2005 to 2015.[3] Several studies conducted in different parts of the country have shown high prevalence of diabetes, hypertension, obesity and CVDs.[4-8] NCDs cause premature deaths, exacerbate poverty and adversely affect the national economy.[9-10]

All age groups and all regions are affected by NCDs. NCDs are often associated with older age groups, but evidence shows that more than 9 million of all deaths attributed to non communicable diseases (NCDs) occur before the age of 60.[1] Of these "premature" deaths, 90% occurred in low- and middle-income countries. Children, adults and the elderly are all vulnerable to the risk factors that contribute to non communicable diseases, whether from unhealthy diets, physical inactivity, exposure to tobacco smoke or the effects of the harmful use of alcohol.

There is an utmost need for Non communicable disease control measures in every corner of the country in view of high and increasing prevalence of NCDs in all strata of society. Ideally NCD prevention and control programmes must be implemented through primary health care.[11] NCD clinics if started at all levels of health care system particularly at primary health centres and community health centres can cater to the unmet need of underprivileged sections of the society for the prevention and management of NCDs. In view of this need for prevention and management of non communicable diseases particularly coronary artery disease, diabetes and hypertension (which are common and life threatening) at the primary health care level with limited resources, an NCD clinic was started by the Department of Community medicine at CHC Gandhinagar which is also the Rural Health and Training centre of Chirayu Medical College. The patients with CAD, hypertension and diabetes are reg-

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istered at the clinic. They are given appropriate drug treatment and counseled regarding prevention and management of their disease and their risk factors. This acts as a primary as well as secondary level of prevention. Patients requiring investigations and tertiary level management are referred appropriately.

This research paper studies the demographic profile and behavioural factors of the patients attending the clinic. Based on the favourable response of this clinic, this research study is expected to encourage the development of such clinics in other parts of the country.

Aim and Objectives of the research were to study the self reported compliance of patients to treatment prior to registration at the clinic and the reasons for non compliance, to study the risk factors of NCDs among the registered patients and to study the self reported compliance to treatment, diet and lifestyle changes as advised at the clinic after 6 months of registration.

MATERIAL AND METHODS

A Observational study was conducted from15[th] January to 14th February 2015 in Department of Community Medicine at its Rural health and Training Centre, Gandhinagar. All the patients registered at the NCD clinic run by the Department of Community Medicine at its Rural health and Training Centre, Gandhinagar were included in the study.

Individuals with diabetes, hypertension and/or history typical of angina are registered at the clinic. Patients with known Coronary artery disease are also registered. Patients with other non communicable diseases like low back pain, knee osteoarthritis, depression etc were not registered but they were given symptomatic treatment and were advised and explained appropriate neck/back exercises (using charts). They were also referred to a higher centre if required.

Ethical clearance: The study is based on the records of NCD clinic run by the department. The data retrieval did not involve any personal identifier. Confidentiality of the records was strictly maintained. Ethical clearance was obtained from the institutional ethical committee.

Data Collection: NCD clinic had a pre-designed proforma on which all the information of the patient was recorded. Clinical history, physical examination of the patient and treatment given was recorded in the proforma. It also contained information on the risk factors of NCDs including anthropometric measures. Advise given was also recorded on the proforma. On follow up *follow up sheets* were attached to the proforma. The self reported compliance was evaluated from the follow up sheets.

BMI categories used for classification of risk of individuals

Normal	- < 23 kg/m^2
Increased Risk	- 23-27.5 kg/m^2
High Risk	- > 27.5 kg/m^2

According to the WHO expert consultation on BMI in Asian populations[12], which met in Singapore from July 8–11, 2002, the purpose of a BMI cut-off point is to identify, within each population, the proportion of people with a high risk of an undesirable health state that warrants a public health or clinical intervention. On the basis of the available data in Asia, the WHO expert consultation concluded that Asians generally have a higher percentage of body fat than white people of the same age, sex, and BMI. It It has been seen that Asian people have higher risk of type 2 diabetes and cardiovascular diseases even below the existing WHO BMI cut-off point of 25 kg/m2 compared to their western counterparts. For Asians therefore public health action is required at lower BMI i.e 23 kg/m^2 Therefore, according to the WHO expert consultation individual is at *increased risk* if BMI is greater than 23 kg/m^2 and at *high risk* if BMI is greater than 27.5 kg/m^2 The suggested categories as per the WHO expert consultation are as follows: less than 18·5 kg/m^2 underweight; 18·5–23 kg/m^2 increasing but acceptable risk; 23–27·5 kg/m^2 increased risk; and 27·5 kg/m^2 or higher high risk[12]

STATISTICAL ANALYSIS

The data from the OPD cards was recorded in the MS excel sheet and the required tabulation and analysis was done.

RESULTS

The NCD clinic runs in RHTC of Chirayu Medical college. This RHTC is functioning as part of a government CHC where medicines are available free of cost. The patients visiting the centre are from poor socio-economic background. Proportion of female patients is higher at the centre including the NCD clinic. As per the prevailing social scenario majority of these females are probably the neglected members of the family who in case of any illness are left with no options other than to visit a government centre where they can avail free consultation and medicines.

Education and Occupation

75% patients were illiterate, the proportion being higher in females. As far as occupation is concerned most of the females which constituted three-fourth of the study population were housewives. Others were in a variety of occupations without any predominance in any particular occupation.

Tobacco chewing/Smoking

Out of 31 male patients 22 (71%) were using tobacco. This figure was 24 (28%) among 85 females. Taken together (male and female combined) 39.6% used tobacco in some or the other form. Nearly three-fourth of the patients were females who have lower rate of tobacco use in general. Therefore the combined proportion of patients with tobacco use would have been otherwise higher if both sexes had equal representation in the study population.

Risk factors in CAD/Angina patients

All patients with CAD had one or more of the major risk factors. There was not a single patient who did not have any of the risk factor. Among the 25 patients with CAD 16 (64%) had BMI > 23, 15 (60%) were diabetic, 14 (56%) were hypertensive and 9 (36%) were using tobacco in some or the other form.

Stress was the most common risk factor being present in 20 (80%) patients. Stress was assessed based on the patient's perception. It was correlated with socioeconomic problems like poverty, unemployment, lack of support from children/husband, loss of family member, poor interpersonal relations

within the family etc. It was not based on a structured questionnaire/tool.

Compliance to treatment

Before Registration: Compliance was poor in all patients. Patinets were coming irregularly and often coming when they had some health problem related to or unrelated to NCDs.

Reasons for non compliance: In majority of the cases reason for non compliance was lack of awareness of the patients about the importance of regular treatment. They were not aware about the complications of diabetes and hypertension. Other reasons were related to the services of the health facility like lack of attention by the doctors, non availability of drugs etc. Patients were given drugs for a short duration for NCDs which need lifelong treatment because of which frequent visits were required to take the drugs.

After Registration: 71 (61.2%) were regularly (At least once in 15 days) coming for follow up and were regularly taking treatment.

Though awareness or increase in knowledge is not evaluated in the study, during the consultation and discussion with patient by the treating physician it was seen that there was rise in awareness among patients about the long term complications of diabetes, hypertension and unhealthy diet and addictions. There was also rise in awareness about the importance of regular treatment and measures to control and prevent the complications.

DISCUSSION

Coronary artery disease is largely subclinical until late stages. Consequently there is underreporting of CAD in all observational studies. The true proportion of CAD cases in the study population is bound to be higher. Therefore the proportion of CAD/angina (Table 1) in this study should not be taken as the true proportion of CAD in the study subjects. ECG has low sensitivity and specificity for detecting CAD. In a study conducted in Kermen, Iran to access the diagnostic performance of ECG in detecting significant CAD sensitivity of ECG for CAD diagnosis ranged between 25.8% and 37.3% and its specificity ranged from 79.0% to 79.9%[13]

Almost two-third of the patients had anthropometric measures beyond the normal range. 68.9% had high BMI (Table 2), 63.8% had high waist circumference (Table 3) amounting to increased or high risk.

Most previous studies have used a cut off 25 kg/m^2 for BMI. In a study conducted in adult population in western India 19% of men and 30% of women were overweight (BMI≥25kg/m^2).[14] In the NCD risk factor survey conducted by ICMR in 2007-08, 20% respondents in the age group of 15-64 years in urban Madhya Pradesh had high BMI (25 kg/m^2).[15] The mean waist circumference in the same study was 74 cms and 67 cms for males and females respectively[15]

In contrast to general population above patients with CAD have higher odds of having high BMI and waist circumference as was seen in a study conducted at AFMC, Pune.[16] The Framingham heart study consistently showed that obesity is associated with increased risk of cardiovascular diseases (CVDs).[17] Much higher proportion of patients have high

BMI and waist circumference in the present study because these patients are high risk groups who already have the consequences of high BMI.

BMI and waist circumference were both higher than normal in nearly similar proportion (59-65%) in hypertension and as well as diabetes (Table 4). In other words both BMI and waist circumference were correlating without any significance difference in hypertensive as well as diabetics in the this study.

Researchers from the Medical Research Council (MRC) Epidemiology Unit, UK, reported in *PLoS Medicine* that waist circumference is strongly associated with type 2 diabetes irrespective of BMI. In a meta-analysis based on published studies from 1966 to 2004 BMI and waist circumference showed similar correlation with diabetes[18]

Many patients who were coming for regular follow up showed good compliance to advice on diet and tobacco ces-

NCD	Male (n=31) (%)	Female (n=85) (%)	Total (n=116) (%)
Hypertension	19 (61.3)	58 (68.2)	77 (66.4)
Diabetes	17 (54.8)	45 (52.9)	72 (62.1)
CAD/Angina*	3 (9.6)	22 (25.8)	25 (21.5)
* Based on old reports/ECG/history of classical angina			
Table-1: NCDs registered at the clinic			

BMI*	Male	Female	Total
Normal (< 23 kg/m^2)	16	20	36
Increased Risk (23-27.5)	11	43	54
High Risk (> 27.5)	4	22	26
* According to the WHO expert consultation on BMI in Asian populations[12]			
Table-2: Body Mass Index of the patients			

	Male	Female	Total
Normal (< 80 cms for women and < 90 cms for men)	20	22	42
Increased	11	63	74
	31	85	116
Table-3: Waist Circumference of patients			

	BMI > 23.5 (%)	Waist circumference > normal for sex (%)
Diabetes (n=72)	44 (61.1)	47 (65.3)
Hypertension (n=77)	46 (59.7)	48 (62.3)
Table-4: Comparison of BMI and waist circumference in Hypertensives and Diabetics		

	Before Registration (%)	After 6 months of registration (%)
Taking salad	3 (2.5)	23 (19.8)
Smoking/tobacco chewing	46 (39.6)	29 (25)
Table-5: Compliance to advice on diet and tobacco cessation		

sation. Many brought about a change in their diet and tobacco use with 17.3% increase in individuals who started taking salad and 14.6% decrease in Tobacco use (Table 5). Even though many patients did not quit smoking and tobacco chewing, the frequency was reduced in all patients who were regularly coming for follow up. However, Patients who are regularly coming for follow up are different from patients who are not coming regularly and are more likely to comply with the diet and lifestyle advise. Main reason for poor compliance encountered during interaction with patients in the OPD was lack of information about the need and importance of regular treatment and diet and lifestyle modification. Other reasons were long waiting time, lack of interest of physicians in treating NCDs and non availability of drugs. Lack of information was also cited as one of the main reasons for non adherence to diet and lifestyle modification in type 2 diabetic patients attending diabetes clinic in a public health facility in Botswana.[19]

CONCLUSION

There was a good response to the NCD clinic. After registration at the clinic many patients (61.2%) started taking treatment regularly. The risk factors among the patients were very common. There was not a single patient without any risk factor. Regular advise by the treating physician at the NCD clinic can bring about a desirable change in the compliance to drugs, diet and lifestyle changes in the population attending the clinic.

Such NCD clinics are therefore likely to have a great impact on the control and progression of NCDs in the long run if a large proportion of the population particularly the underprivileged section of the society is covered by these clinics. This will bring down the socio-economic burden of NCDs. In view of the increasing prevalence of NCDs more so at a younger age, NCD clinics at every health facility is the need of the hour. They will fulfill the unmet need of the underprivileged section of the society for prevention and management of NCDs.

REFERENCES

1. Global Status Report on Non Communicable Diseases, 2010
2. Murray CJ, Lopez AD. The global burden of disease: a comprehensive assessment of mortality and disability from disease, injury, and risk factors in 1990 and projected for 2020. vol. 1. (Global Burden of Disease and Injury Series). Cambridge: Harvard University Press; 1996.
3. Jha P, Peto R, Zatonski W, Boreham J, Jarvis MJ, Lopez AD. Social inequalities in male mortality, and in male mortality from smoking: indirect estimation from national death rates in England and Wales, Poland, and North America. Lancet 2006;368:367-70.
4. Mohan V, Deepa M, Deepa R, Shanthirani CS, Farooq S, Ganesan A, et al. Secular trends in the prevalence of diabetes and impaired glucose tolerance in urban South India-the Chennai Urban Rural Epidemiology Study (CURES-17). Diabetologia 2006;49:1175-8.
5. Gupta R, Pandey RM, Misra A, Agrawal A, Misra P, Dey S, et al. High prevalence and low awareness, treatment and control of hypertension in Asian Indian wom-

en. J Hum Hypertens 2011. [In Press].
6. Misra A, Khurana L. The metabolic syndrome in South Asians: epidemiology, determinants, and prevention. Metab Syndr Relat Disord 2009;7:497-514.
7. Mohan V, Deepa M, Farooq S, Prabhakaran D, Reddy KS. Surveillance for risk factors of cardiovascular disease among an industrial population in southern India. Natl Med J India 2008;21:8-13.
8. Gupta R, Kaul V, Bhagat N, Agrawal M, Gupta VP, Misra A, et al. Trends in prevalence of coronary risk factors in an urban Indian population: Jaipur Heart Watch-4. Indian Heart J 2007;59:346-53.
9. Narain JP, Garg R, Fric A. Noncommunicable diseases in South-East Asia Region: burden, strategies and opportunities. Natl J Med India. 2011;24:280–7.
10. Geneva: World Health Organization; 2011. WHO Global Status report on Noncommunicable diseases 2010.
11. Samb B, Desai N, Nishtar S, Mendis S, Bekedam H, Wright A, et al. Prevention and management of chronic disease: a litmus test for health-systems strengthening in low-income and middle-income countries.Lancet. 2010;376:1785–97.
12. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies, WHO Expert Consultation, Lancet 2004;363:157–63
13. Mahmoodzadeh S, Moazenzadeh M, Rashidinejad H, Sheikhvatan M. Diagnostic performance of electrocardiography in the assessment of significant coronary artery disease and its anatomical size in comparison with coronary angiography. Journal of Research in Medical Sciences : The Official Journal of Isfahan University of Medical Sciences. 2011;16:750-755.
14. Shukla HC, Gupta PC, Mehta HC, Hebert JR. Descriptive epidemiology of body mass index of an urban adult population in western India. J Epidemiol Community Health. 2002;56:876-80.
15. National Institute of Medical Statistics, Indian Council of Medical Research (ICMR), 2009, IDSP Non-Communicable Disease Risk Factors Survey, Phase-I States of India, 2007-08. National Institute of Medical Statistics and Division of Non-Communicable Diseases, Indian Council of Medical Research, New Delhi, India.
16. Rohit Singh, Prakash M., Radhika Dubey, Kaushik Roy, Atul Kotwal and Ajoy Mahen. Body composition parameters as correlates of coronary artery disease. Indian J Med Res 2013:138:1016-1019.
17. Hubert HB, Fenileib M, McNamara PM, et al. Obesity as an independent risk factor for cardiovascular disease: a 26-year follow-up of participants in the Framingham heart study. Circulation. 1983;67:968–977.
18. Gabriela Vazquez, Sue Duval, David R. Jacobs Jr. and Karri Silventoinen, Comparison of Body Mass Index, Waist Circumference, and Waist/Hip Ratio in Predicting Incident Diabetes: A Meta-Analysis, Epidemiol Rev 2007;29:115-128.
19. Ganiyu AB, Mabuza LH, Malete NH, Govender I, Ogunbanjo GA. Non-adherence to diet and exercise recommendations amongst patients with type 2 diabetes mellitus attending Extension II Clinic in Botswana. Afr J Prm Health Care Fam Med. 2013;5:457-462.