DOI: 10.21276/aimdr.2017.3.6.CM3

Original Article ISSN (O):2395-2822; ISSN (P):2395-2814

Risk Factors Linked To Noncommunicable Diseases: A Community Based Case Control Study.

Ganesh Pillai[1], Ashok J[2], Rajesh SS[3], Ashiq Mir[4], Anupama M[1], Suhitha R Das[5]

[1]Post Graduate, Sri Siddhartha Medical College, Tumkur.
[2]Professor, Sri Siddhartha Medical College, Tumkur.
[3]Assistant Professor, Sri Siddhartha Medical College, Tumkur.
[4]SMO-WHO.
[6]Post Graduate, Sri Siddhartha Medical College, Tumkur.

Received: September 2017
Accepted: September 2017

ABSTRACT

Background: Physical activity and exercise are important part for better physical and mental health including the older adults .TV viewing which is a common type of sedentary behaviour in developed and developing countries is being paid less attention. Excess sleep or lack of sleep is a predisposing factor for NCDs such as DM. Objectives: 1.To assesses the physical activity and TV viewing patterns among adults in the age group of 20 to 60 years, among cases and controls in the urban field practice area of a medical college. 2 To assess the sleep patterns among cases and controls in same study population. **Methods:** It is a community based case control study. The data was collected from individuals in the age group of 20 to 60 years among cases and controls. Cases were those diagnosed with Hypertension and DM. Those who were found negative were taken as controls. Purposive sampling was done with a sample size of 108. Semi structured questionnaire was used. Descriptive statistics and odds ratio was calculated. **Results:** Cases were found to have physical Inactivity when compared to the controls.TV viewing was highest among cases when compared to the controls. Excess sleep or lack of sleep is found to have a positive risk factor for development of NCDs. **Conclusion:** Physical inactivity was more among the cases when compared to the controls.TV viewing of more than 4 hours were highest among the cases when compared to the controls. Sleep of less than 6 hours was more among the cases

Keywords: Physical Inactivity, TV viewing, hours sleep.

INTRODUCTION

Today the leading driver of mortality across the globe are chronic, non-communicable diseases (NCDs). Data sourced from various studies show that cardiovascular diseases, either ischaemic heart disease or cerebrovascular disease, are now the leading killers. Nearly 80% of all heart attacks around the globe occur in low and middle income countries and this disease alone claims more than twice as many lives as HIV/AIDS, tuberculosis and malaria combined. Moreover, age-standardized mortality shows that NCDs are killing people at increasingly younger ages in resource-poor settings. There is strong evidence that deaths from NCDs in resource-poor settings often occur in the backdrop of communicable diseases like including HIV and tuberculosis and this results in the 'double' burden of disease. Recent data demonstrates that for the first time in India's history, the burden of non-communicable disease has eclipsed that of communicable diseases.

Past decade has witnessed substantial developments in diagnostics and therapeutics. While continued improvement in these areas is desirable, modification of risk factor modification is a necessity. Levels of physical inactivity are rising in many countries with major implications for the general health of people worldwide and for the prevalence of NCDs such as cardiovascular disease, diabetes and their risk factors such as raised blood pressure, raised blood sugar and overweight. Physical inactivity is estimated as being the principal cause for approximately 27% of diabetes and approximately 30% of ischemic heart disease burden1. TV viewing which is a form sedentary type of behaviour is a risk factor for Diabetes mellitus as well as cardiovascular diseases. Similarly, many authors have proposed that sleep duration of 6 hours or less or 9 hours or more is associated with increased prevalence of DM. With this background, this study aims to understand and identify risk factors which are associated with NCDs in a community using a case control study design.

Name & Address of Corresponding Author
Dr. Ganesh Pillai, PG student
Department of Community Medicine,
Sri Siddhartha Medical College,
B.H. Road, Agalkote, Tumkur,
Karnataka 527107

MATERIALS AND METHODS

Study Design and Setting

We designed a community based case control study in the urban field practice area of Department of Community Medicine, Sri Siddhartha Medical College, Tumkur city, which is located 76 kms from Bangalore, Karnataka, India. The urban field practice area is located at Maralur Dinne, which is 9 kms away from the medical college. A semi-structured questionnaire was designed and pre-tested in a pilot fashion. We obtained approval of the institutional ethics committee before enrolling the participants.

Sample population

We used purposive sampling for identifying the sample for this study. In the urban field practice area, we conducted house to house visits and those with established diagnosis of DM, hypertension and obesity were taken as cases. Diagnosis of DM and hypertension was made based on history given, previous medical prescriptions and medications taken regularly. We did measure random blood sugar (RBS) using hand held glucometer and blood pressure using a manual sphygmomanometer. RBS more than 126 mg/dL were diagnosed as diabetics and systolic blood pressure more than 140 mm of Hg and diastolic blood pressure more than 90 mm of Hg were considered hypertensives. Screening is done for those who do not give history of DM, hypertension and obesity and those who were found to be negative were taken as controls. All respondents were explained the nature of the study and written informed consent was taken from them. We excluded patients who had any co-morbidities, complications and those who refused the consent.

Data Collection and Data Analysis

Using pretested semi-structured questionnaire we interviewed the respondents. We collected socio-demographic information for each of the respondents like age, gender, residence, education, monthly income and occupation.We measured RBS and blood pressure of the respondents. Based on the history given we assessed patterns of physical activity, which were classified as active, moderate and sedentary. In this study the people were asked to classify the physical activity at work according to four categories (a) sitting most of the day (sedentary); (b) standing most of the day but little motion (moderately active): (c) walking or carrying light weights (active); (d) work requiring intense physical activity (very active). Similarly, four categories of physical activity at leisure time were used: (a) sitting most of the time (sedentary); (b) walking, cycling, gardening (moderately active); heavier activities jogging, cycling, tennis (active); (d) athletics or regular sports training (very active). Due to the small number of individuals, categories (c) and (d) were collapsed into one `active' category. We also asked about the pattern of television viewing. Inquiry was made in to how many hours of television was viewed each day. Patterns of sleep was asked to each respondents and classified as less than 6 hours, 7 to 8 hours and more than 9 hours of sleep. Comparisons were made between cases and controls with respect to different risk factor variables. We tabulated the data and calculated the frequencies and percentages for different variables and performed descriptive analysis.

RESULTS

We included 54 cases and same number of controls in this study. Among the 54 cases 41% of the cases had both diabetes and hypertension whereas 30% of the cases had diabetes and 29% of the cases had hypertension. Among the 54 cases 68% of the cases were in the age group of 51 to 60 years, 29% of the cases were in the age group of 41 to 50 years and rest 3% of the cases were in the age group of 31 to 40 years [Table 1]. Majority of the cases had a sedentary physical activity (46%) and majority in controls had active physical activity (56%). 76% of the controls had TV viewing each day of less than 4 hours, while in cases majority had more than 4 hours. 43% of the controls slept 7 to 8 hours a day, while 48% of the cases slept for less than 6 hours. Further we found that physical inactivity had 5.71 higher odds [95% confidence interval (CI) of 2.48 to 13.11, p value less than 0.0001] of developing either DM, hypertension, obesity or all [Table 2].

Table 1: Baseline characteristics of cases and controls included in the study

Variables	Cases (n=54)	Controls (n=54)
Age distribution		
31-40 years	2 (4%)	5 (9%)
41-50 years	15 (28%)	19 (35%)
51-60 years	37 (69%)	30 (56%)
Physical activity		
Sedentary	25 (46%)	6 (11%)
Moderate	20 (37%)	18 (33%)
Active	9 (17%)	30 (56%)
TV viewing each day		
less than 4 hours	25 (46%)	41 (76%)
More than 4 hours	29 (54%)	13 (24%)
Sleeping pattern each day		
less than 6 hours	26 (48%)	19 (35%)
7 to 8 hours	10 (19%)	23 (43%)
More than 9 hours	18 (33%)	12 (22%)

Table 2: Risk of non-communicable diseases (DM, Hypertension and Obesity) with physical inactivity

Physical activity	Cases	Controls	Total
Physical inactive	36	14	50
Physically active	18	40	58
Total	54	54	108

Odds ratio is 5.71, 95% confidence intervals 2.48 to 13.11, p value less than 0.0001

DISCUSSION

The present study showed positive association between physical inactivity and NCDs as 73% of the cases were physically inactive. The magnitude

of association of TV viewing and NCDs were consistent with other studies. It has been said that TV viewing may be predictor for sedentarism or inactivity. Lower energy expenditure, weight gain, and increased risk of type 2 diabetes are associated with sedentary lifestyle. Studies have shown that among sedentary behaviours of which prolonged television watching is an important component these days, is consistently associated with the development of obesity and diabetes. Even without weight gain, physical inactivity appears to increase the risk of type 2 diabetes. In a cohort study in Sweden low aerobic capacity and muscle strength at 18 years of age, both of which are linked to lower physical activity, was associated with an increased risk of type 2 diabetes two and half decades later, even among men with normal BMI. Obesity, another variable studied in our research, is associated with physical inactivity. In a review of of data from the National Health and Nutrition Examination Survey (NHANES), obesity was strongly and inversely related to moderately vigorous physical activity, and this association was stronger than either television (TV) time or total sedentary.

Quantity and quality of sleep may also predict the risk of development of type 2 diabetes mellitus, as illustrated by the findings of this study and the findings of a previously published meta-analysis of 10 studies. Similar to findings of our study, a report from the European Prospective Investigation into Cancer and Nutrition (EPIC) study of more than 23,000 participants across Europe, short sleep duration (<6 hours/day) was associated with an increased risk of chronic disease, including type 2 diabetes (6.7 cases versus 4.2 cases per 1000 person-years, HR 1.44, 95% CI 1.10-1.89). However, it is not clearly understood if there is a unique relationship between sleep patterns and diabetes risk.

Further research is required to understand whether sleep disruption associated with obesity has some pernicious effects on diabetes risk, or whether other mechanisms may play a role in diabetes development. Through its effect on melatonin secretion short sleep duration may increase the risk of diabetes. As it has been shown that sleep disruption is associated with decreased melatonin secretion, as it has been reported in an observational study that lower melatonin secretion was independently associated with a higher risk of developing type 2 diabetes. Another lifestyle change that may have negative metabolic consequences is sleep extension. This was described in a study in which the subjects underwent two nights of sleep restriction (four hours per night) and two nights of sleep extension (10 hours per night) in a randomized order, spaced six weeks apart with controlled conditions of dietary intake and physical activity.

Our study has some limitations. The results of this study might not be generalizable to other geographic areas, because of variability in cultural, social and demographic determinants. Moreover, there is a potential of selection bias while enrolling the cases and controls.

CONCLUSION

Our study showed that physical inactivity was more among cases(73%) when compared to the controls and TV viewing of more than 4 hours were highest in cases as compared to the controls.Future research should focus on understanding the mechanisms by which these risk factors play a role in causing non communicable diseases.

REFERENCES

1. Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJ. Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. The Lancet. 2006 Jun 2;367(9524):1747-57.
2. Mathers C. The global burden of disease: 2004 update. World Health Organization; 2008.
3. Meschia JF, Bushnell C, Boden-Albala B, et al. Guidelines for the primary prevention of stroke: a statement for healthcare professionals from the American Heart Association/American Stroke Association. Stroke 2014; 45:3754.
4. Grøntved A, Hu FB. Television viewing and risk of type 2 diabetes, cardiovascular disease, and all-cause mortality: a meta-analysis. Jama. 2011 Jun 15;305(23):2448-55.
5. Yaggi HK, Araujo AB, McKinlay JB. Sleep duration as a risk factor for the development of type 2 diabetes. Diabetes care. 2006 Mar 1;29(3):657-61.
6. Crump C, Sundquist J, Winkleby MA, et al. Physical Fitness Among Swedish Military Conscripts and Long-Term Risk for Type 2 Diabetes Mellitus: A Cohort Study. Ann Intern Med 2016; 164:577.
7. Maher CA, Mire E, Harrington DM, et al. The independent and combined associations of physical activity and sedentary behavior with obesity in adults: NHANES 2003-06. Obesity (Silver Spring) 2013; 21:E730.
8. Cappuccio FP, D'Elia L, Strazzullo P, Miller MA. Quantity and quality of sleep and incidence of type 2 diabetes: a systematic review and meta-analysis. Diabetes Care 2010; 33:414.
9. von Ruesten A, Weikert C, Fietze I, Boeing H. Association of sleep duration with chronic diseases in the European Prospective Investigation into Cancer and Nutrition (EPIC)-Potsdam study. PLoS One 2012; 7:e30972.
10. McMullan CJ, Schernhammer ES, Rimm EB, et al. Melatonin secretion and the incidence of type 2 diabetes. JAMA 2013; 309:1388.
11. Spiegel K, Tasali E, Penev P, Van Cauter E. Brief communication: Sleep curtailment in healthy young men is associated with decreased leptin levels, elevated ghrelin levels, and increased hunger and appetite. Ann Intern Med 2004; 141:846.

How to cite this article: Pillai G, Ashok J, Rajesh SS, Mir A, Anupama M, Das SR. Risk Factors Linked To Noncommunicable Diseases: A Community Based Case Control Study. Ann. Int. Med. Den. Res. 2017; 3(6):CM12-CM14.

Source of Support: Nil, **Conflict of Interest:** None declared