DOI Number: 10.5958/2320-608X.2020.00001.3

A Study on the Impact of Exercise on Diabetic and Hypertensive Status of the Patients

Arpith Mysore Ninge gowda[1] , Revathi Devi Mysore Laxmipathi[2], Dinesh. B[3]

[1]Post MD Tutor, [2]Professor and Head Department of Physiology, [3]Associate Professor, Department of Cardiology, Mysore Medical College and Research Institute, Mysuru, Karnataka, India

Abstract

Introduction and Aim: Type 2 Diabetes mellitus and essential hypertension are common non communicable disorders that are frequently present together. Hypertension in the type 2 diabetic individual increases the risk and accelerates the course of cardiac disease, peripheral vascular disease, stroke, retinopathy and nephropathy. The hallmark of hypertension in type 1 and type 2 diabetics appears to be increased peripheral vascular resistance. Carbohydrate food intake has a direct effect on postprandial glucose levels in people with diabetes and it is the principal macronutrient of concern in diabetics for glycemic management[1]. In addition, an individual's food choices and energy balance have an effect on body weight, blood pressure and lipid levels directly. To study the importance of influence of exercise on diabetics and hypertensive patients attending medicine Out Patient Department, KR Hospital.

Materials and Method: All the patients attending the medicine OPD of KR Hospital, Mysoreor 3 months, 210 patients having both hypertension and diabetes were selected cross sectionally, including both males and females of age group 35-50 years. They were categorized as regularly doing exercise and not doing exercise group. All of patients were screened for diabetic and hypertension by checking fasting blood glucose, post prandial blood glucose and blood pressure, exercise and body mass index were also compared.

Results: The study found that, the status of known cases, of type 2 diabetic mellitus and hypertension, who were regularly doing exercise showed statistically significant controlled levelscompared to those who were not doing exercise.

Conclusion: The study found that known cases of type 2 diabetic mellitus and hypertension are benefitted by regularly doing exercise when compared with not doing exercise.

Keywords*: Type 2 Diabetes mellitus; Hypertension; Body mass index (BMI); Exercise.*

Introduction

In India, the younger adults getting type 2 diabetes mellitus (DM) has alarmed the nation and the fear that the productive population getting the disease related complication might decrease the working productivity and in turn development of the nation. India has made an overwhelming economic progress in recent years and is the emerging market but on the other hand it is lagging behind others in healthcare outcomes. Every fifth person in India is diabetic, which made it the world's capital of Diabetics[2]. Hypertension (HTN) is a close associate of diabetes which runs parallel. It is projected that the total number of people with diabetes will rise from 171 million in 2000 to 366 million by 2030. The number of adults with hypertension is predicted to increase by 60% to a total of 1.56 billion people by 2025[3]. Hypertension and Diabetic are common non communicable disorders that share a significant overlap in underlying modifiable

Corresponding Author:
Revathi Devi Mysore Laxmipathi
Professor and Head Department of Physiology
Department of medicine. Mysore Medical College and Research Institute, Mysuru, Karnataka, India
email: drrevathidevi1@gmail.com

and non-modifiable risk factors (including ethnicity, hereditary, smoking, alcohol, dyslipidemia and lifestyle determinants) and complications[4]. In some cases, both hypertension and diabetic mellitus may be present simultaneously at the time of initial diagnosis.Dietary habits and sedentary lifestyle are the major factors for rapidly rising incidence of non-communicable disorders among developing countries. In type 2 diabetics, recently, elevated HbA1c level has also been considered as one of the leading risk factors for developing microvascular and macrovascular complications. Improvement in the elevated HbA1c level can be achieved through diet management. Thus, the patients could be prevented from developing the diabetes complications. Awareness about diabetes complications and consequent improvement in dietary knowledge, attitude, and practices lead to better control of the disease[5]. Over the past few decades, a lot of effective drugs have been developed for the treatment of hypertension and diabetes mellitus. Hence proper education regarding the disorder, drug dosage and timing, dietary pattern and life style modification play very important role in controlling both hypertension and diabetes mellitus. The objective of this was to study the importance of influence of exercise on diabetic and hypertensive status of population.

Materials and Method

The study is a randomized cross-sectional study, all the patients attending the medicine Out Patient Department of KR Hospital, Mysuru for 3 months. It is a cross sectional study, 210 patients having both hypertension and diabetes were selected including both males and females of age group 35-50 years. They were then divided into two groups based on exercise status like regularly doing exercise (n=110) and not doing exercise (n=100). All of them were screened for diabetes and hypertension by checking fasting blood glucose, post prandial blood glucose and blood pressure levels.

Inclusion criteria:

- Subjects having both Type 2 Diabetes and Hypertension, having at least one of them for 5 years or more and under treatment and compliant with treatment.
- Age group 35-50 years.
- Exercise group consisted of patients who were doing exercise 5 days in a week, 30-45 minutes/day.
- Non-exercise consisted of patients who were not doing any form of exercise.

Exclusion criteria:

- Cardiovascular disorders other than hypertension
- H/o of Major surgeries in the past 6 months
- H/o/smoking/alcohol intake
- H/o Reno vascular diseases.
- H/o infectious diseases.

Statistical analysis:R software was used for analysis of data. Chi square value and test of significance used.

Results

Among 210 study population in the KR Hospital, 120 (57%) males and 90 (43%) females are categorized following age groups from 35-50 years (Table 1). In this study of 210 diabetic patients, 110 patients were regularly doing exercises, in that 70 (63%) had a controlled diabetic status and 40 (37%) were not under control; 100 patients were not doing exercises regularly, in that 40 (40%) had a controlled diabetic status and 60 (60%) were not under control. P value <0.001 showed statistically significant (Table 2).

In this study of 210 hypertensive patients, 110 patients were regularly doing exercises, in that 70 (63%) had a controlled hypertensive status and 40 (37%) were not under control; 100 patients were not doing exercises regularly, in that 40 (40%) had a controlled hypertensive status and 60 (60%) were not under control. P value <0.001 showed statistically significant (Table 3).

Discussion

The present study agrees with the study done by Miller[6]showed regular exercise and dietary education will influence in the non-communicable diseases. Diet, Exercise, Weight loss intervention trial (DEW-IT) showed that exercise incorporated lifestyle interventions can result in significantly better blood pressure and diabetes control among patients taking pharmacotherapy.

The present study reports are also in accordance with the study reports by Khattab[7] dietary counselling must be provided to the patients with type 2 diabetes and hypertension at tertiary care hospital.

The present findings agree with the study done by

Wens J Vermeire[8] who assessed perspectives of type 2 diabetes patients adherence to treatment and concluded that the overall effects of lack of lifestyle measures information would include knowledge and skill deficits and thus, leading to poor glycemic control. This suggests the need for diabetes educational program to improve diet and exercise adherence.

The present result is similar to study done by Egan[9] in which need to identify the specific barriers to exercise in the individual to improve health outcomes.

The study revealed that level of diabetes and hypertension awareness among patients and general population was low. Another study conducted in India by Shah[10] reported that 63% of Type 2 Diabetes Mellitus patients did not had the insight of these diseases and the majority were also unaware about its complications.

Table 1: Profile of study population

Age (years)	Male	Female	Total (%)
35-40	30	20	50 (24%)
40-45	40	25	65 (31%)
45-50	30	25	55 (26%)
>50	20	20	40 (19%)
Total	120	90	210 (100%)

Table 2: Diabetic status and exercise

Diabetic status	Regularly doing exercise	Not doing exercise	Total (%)
Under control	70	40	110 (52%)
Not under control	40	60	100 (48%)
Total	110	100	210 (100%)

Chi square value 10.804, degree of freedom 1, p<0.001.

Table 3: Hypertension and exercise

Hyperten-sion status	Regularly doing exercise	Not regularly doing exercise	Statistical value
Under control	70	40	110 (52%)
Not under control	40	60	100 (48%)
Total	110	100	210 (100%)

Chi square value 10.804, degree of freedom 1, p<0.001.

Conclusion

The study found that known cases of type 2 diabetic mellitus and hypertension are benefitted by regularly doing exercise when compared with not doing exercise.

The various studies suggest that T2DM patients and hypertension require reinforcement of DM education including dietary management through health-care providers, health facilities, etc.) toencourage them to understand the disease management better, for more appropriate self-care and better quality of life. The overall purpose of treating T2DM is to help the patients from developing early end-organ complications which can be achieved through proper dietary management and exercise. The success of dietary management and exercise requires that the health professionals should have an orientation about the cultural beliefs, thoughts, family, and communal networks of the patients. As diabetes is a disease which continues for the lifetime, proper therapy methods with special emphasis on diet should be given by the healthcare providers in a way to control the disease, reduce the symptoms, and prevent the appearance of the complications. The patients should also have good knowledge about the disease, diet and exercise, for this purpose, the health-care providers must inform the patients to make changes in their nutritional habits and food preparations. Active and effective life style education may prevent the onset of non-communicable diseases like hypertension and diabetes and its complications.

Limitations

Possibility of effect of confounders cannot be ruled out by this study design.

The research question can be further explored by clinical trial design or case control design for more validity.

Recommendations

Health care instructors should be aware of the factors related to the non-adherence of lifestyle modification and should try to intervene them.

Ethical Clearance- Taken from institutional committee.

Source of Funding- Self.

Conflict of Interest- Nil.

References

1. Holman, R.R., Paul, S.K., Bethel, M.A., Matthews, D.R., Neil, H.A. 10-year follow-up of intensive glucose control in Type 2 diabetes. N Engl J Med 2008; 359:1577-1589.
2. Joshi, S.R., and Parikh, R.M. India - Diabetes Capital of the World: Now Heading Towards Hypertension, JAPI, Editorial. 2007; 55: 323-324.
3. Lago, R.M., Premranjan P Singh and Richard W Nesto, Diabetes and hypertension, Nature clin. practice endo and metabolism, Editorial, Oct 2007 vol 3 no 10,667
4. Amanda, N.Long, DO and Samuel Dagogo-Jack, MD,The Comorbidities of Diabetes and Hypertension: Mechanisms and Approach to Target Organ Protection, J ClinHypertens (Greenwich). 2011; 13(4): 244-251.
5. R. Klein, B.E.K. Klein, K.E. Lee, K.J. Cruickshanks, and S.E. Moss, "The incidence of hypertension in insulin-dependent diabetes,", Archives of Internal Medicine, vol.156,no.6, pp.622-627, 1996.
6. E.R. Miller 3rd , T.P. Erlinger and D.R.Young "Results of the diet, exercise and weight loss intervention trial (DEW-IT)", Hypertension vol. 40, no 5, pp 612-618, 2002.
7. Khatttab, M., Khader, S. Y. Factors Associated with poor glycemic control among patients with Type 2 Diabetes. Journal of Diabetes and its complications 2010, 24, 84-89.
8. Wens, J., Vermeire, E. Perspectives of Type 2 Diabetes patients' Adherence to treatment: A qualitative analysis of barriers and solutions. BMC family practice, 2005: 6: 20-29.
9. Egan, M. A., Mahmood W. A., Barriers to exercise in obese patients with Type 2 Diabetes 2013. 106(7); 635-638.
10. Shah VN, Kamdar PK, Shah N Assessing the knowledge, attitudes and practice of Type 2 diabetes among patients of Saurashtra region, Gujarat. Int J Diabetes Dev Ctries 2009;29: 118-122.