

Research Article

Prevalence of stress and diabetes in the population of Bareilly District (U.P.)

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ABSTRACT

Stress is defined as a stimulus event of sufficient severity to produce disequilibrium in the homeostasis of physiological system. The aim of present study to find out the people under stress among normal and diabetic population of Bareilly district. A total number of 4565 participants aged between 20 to >54 years of Bareilly district have attended the various health check-up camps. In which 1978(76.4%) males and 1671(84.5%) females were normal and 610(23.6%) males and 306(15.5%) females were diabetic. There were 769(38.9%) people under stress in normal male population and 282(46.2%) in diabetic male population while 678(40.6%) females in normal population and 173(56.5%) females in diabetic population were found to be stressed. The observations of the present studies however, indicate that stress is one of the risk factor of diabetes, but with limited resources it is difficult to draw any conclusion regarding a direct link between stress and diabetes. More work is necessary in this field.

Keywords: Stress, diabetes, Bareilly (U.P.)

Introduction

Stress is defined as a 'stimulus event of sufficient severity to produce disequilibrium in the homeostasis of physiological systems. Stress is the most common cause of ill health in our society, probably underlying as many as 70% of all visits to family doctor. Stress reduces body resistance and childhood stress leads to adult health problems. In recent years, the complexities of the relationship between stress and diabetes have become well known but have not been well researched, some studies have suggested that stressful experiences might affect the onset and/or the metabolic control of diabetes but these findings have often been inconclusive but a number of studies suggest that psychosocial stress play an important

role in the development of diabetes (Bjorntorp et al., 1999; Rosmond and Bjorntorp, 2000; Mooy et al., 2000; Surwit et al., 2002; Agardh et al., 2003 and Norberg et al., 2007). In people who have diabetes, stress can alter blood sugar levels (Mitra, 2008). Psychosocial adversity seems to play a role in diabetes mellitus and obesity, despite the fact that the direct relationship between these disorders and stressful life events is yet to proven (Williams, et al., 2013).

Stress is a complex area of research, much of it has been conducted in children and adolescents, with fewer studies in adults or in those with type 2 diabetes, using a number of different measurement tools (Lloyed et al., 2005). The present study was conducted to find out the people under stress in normal and diabetic population of Bareilly.

Material and Method

During present study medical camps were organized at different places of Bareilly district. A total number

Received: 19.07.2020, **Revised:** 21.08.2020,

Accepted: 28.08.2020

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of 4565 participants aged between 20 to >54 years have attended these camps and a questionnaire was placed before all participants, they answered all the questions voluntarily. The questionnaire included the details regarding age, sex, monthly income, hobbies, food habits, daily routine, occupation and disease, if any. The health check-up included complete clinical examination like strip test method for diabetes by trained technicians. The people under stress could be identified through a separate questionnaire.

Results

In a total of 4565 participants, 3649(79.9%) participants were normal and 916(20.1%)

participants were found to be diabetic. Among normal individuals 1978(76.4%) were males and 1671(84.5%) were females whereas among diabetic individuals 610(23.6%) were males and 306(15.5%) were females (Table 1). The significant results of stress were found among normal and diabetic population of Bareilly during a survey by a questionnaire. There were 769 (38.9%) people under stress in normal male population and 282 (46.2%) in diabetic male population (Table 2, Fig. 1A) while 678 (40.6%) females in normal population and 173 (56.5%) females in diabetic population were found to be stressed (Table 3, Fig. 1B).

Table 1. Distribution of normal and diabetic males and females in the population examined in Bareilly

	Normal		Diabetic	
	No. of Subjects	Percentage	No. of Subjects	Percentage
Male	1978	76.4	610	23.6
Female	1671	84.5	306	15.5
Total	3649	79.9	916	20.1

Table 2. Distribution of people under stress in normal and diabetic male population of Bareilly

	Normal male		Diabetic male	
	Number	Percentage	Number	Percentage
Normal	1209	61.1	328	53.8
People under stress	769	38.9	282	46.2
Total	1978	100	610	100

Chi square test (χ^2) - 10.448

Table 3. Distribution of people under stress in normal and diabetic female population of Bareilly

	Normal female		Diabetic female	
	Number	Percentage	Number	Percentage
Normal	993	59.4	133	43.5
People under stress	678	40.6	173	56.5
Total	1671	100	306	100

Chi square test (χ^2) - 26.877

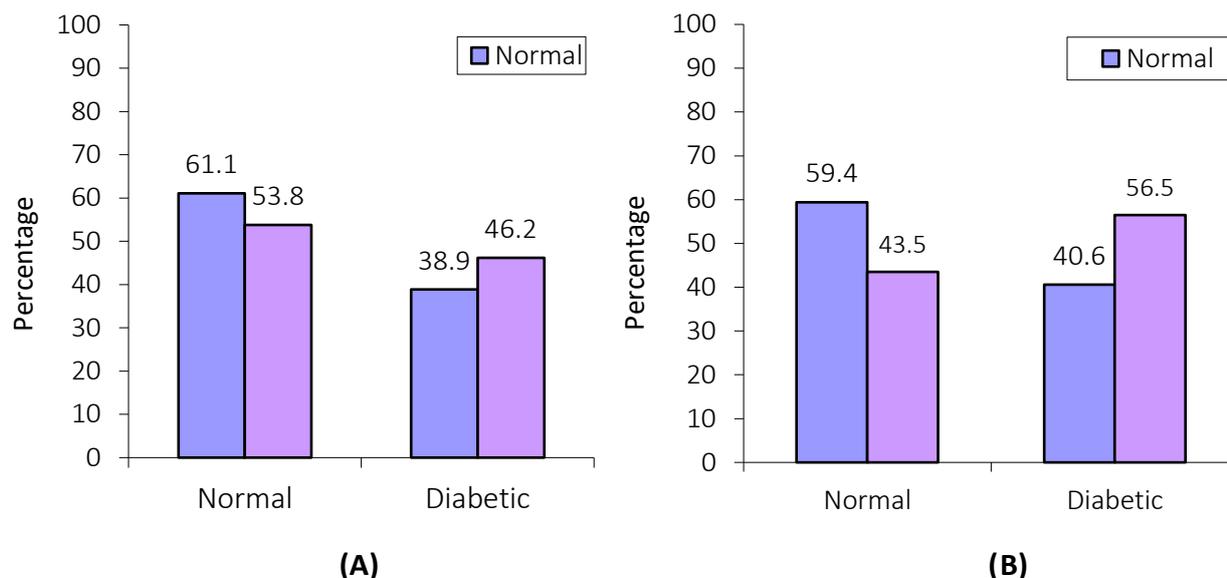


Fig 1. Distribution of people under stress in normal and diabetic male and female population of Bareilly

Discussion

A number of factors e.g. education, income, marriage, career, illness, personal and official problems etc. have been recorded during the present studies to causes stress in population of Bareilly. Experiences of stress may lead to other unhealthy habits, such as smoking, drinking and drug addictions etc. which in turn are linked to poor glucose metabolism and also to a greater risk of developing diabetes complications (Spangler et al., 2001). Several studies have supported the hypothesis that stress is a major contributor to the chronic hyperglycemia that is associated with type 2 diabetes mellitus (Hackett et al., 2017). The observations of the present studies however, indicate that stress is one of the risk factor of diabetes (Table 2 and 3). Lloyed et al. (2005) also reported a link between stress and diabetes. Bjorntorp (1997) explained the physiological links between stress and onset of diabetes. Surwit et al. (2002) and DeVries et al. (2004) focused their attention on the possibilities of stressful experiences influencing diabetes. Mussa et al. (2019) have shown that personalized intervention that involve management of stress, enhancement of recovery, and improvement of sleep pattern have a significant effect on glycemic control with type 2 diabetes mellitus. With the numerous measurement

strategies and different populations that have been investigated through the years, definite conclusions are difficult to draw. Smaller in depth studies have usually demonstrated a link between stress and diabetes, whereas the studies on larger groups using self report checklists to measure the occurrence of stressful experiences have sometimes failed to support this link.

Stress is an integral part of the natural fabric of life. Attention is drawn to the close association between the increased stress and the occurrence of various physical disorders like cardiovascular diseases, cancer, diabetes etc. However, with the limited resources it is difficult to draw any conclusion regarding a direct link between stress and diabetes. More work is necessary in this field.

References

1. Agardh, E.E., Ahlbom, A. and Andersson, T., Efendic S, Grill V, Hallqvist J, Norman A, Ostenson CG (2003). Work stress and low sense of coherence is associated with type 2 diabetes in middle aged Swedish women. *Diabetes Care*. 26: 719-724.
2. Bjorntorp, P. (1997). Body fat distribution, insulin resistance, and metabolic diseases. *Nutrition*. 13: 795-803.

3. Bjorntorp, P., Holm, G. and Rosmond, R. (1999). Hypothalamic arousal insulin resistance and type 2 diabetes mellitus. *Diabet. Med.* 16: 373-383.
4. DeVries, J.H., Snoek, F.J. and Heine, R.J. (2004). Persistent poor glycemic control in adult type 1 diabetes: a closer look at problem. *Diabet. Med.* 21: 1263 -1268.
5. Lloyed, C., Smith, J. and Weinger, K. (2005). Stress and Diabetes: A review of the links. *Diabetes spectrum.* 18: 121 – 127.
6. Mitra, A. (2008). Diabetes and stress: A review. *Ethno. Med.* 2: 131-135.
7. Mooy, J.M., DeVries, H., Grootenhuys, P.A., Bouter, L.M. and Heine, R.J. (2000). Major stressful life events in relation to prevalence of undetected type 2 diabetes: The Hoorn Study. *Diabetes Care.* 23: 197-201.
8. Norberg, M., Stenlund, H., Lindaholm, B. Andersson, C., Eriksson, J.W. and Weinehall, L. (2007). Work stress and low emotional support is associated with increased risk of future type 2 diabetes in women. *Diabetes Res. Clin. Pract.* 76: 368-377.
9. Rosmond, R. and Bjorntorp, P. (2000). The hypothalamic-pituitary-adrenal axis activity as a predictor of cardiovascular disease, type 2 diabetes and stroke. *J. Intern. Med.* 247: 188-197.
10. Spangler, J.G., Summerson, J.H., Bell, R.A. and Konen, J.C. (2001). Smoking status and psychosocial variables in type 1 diabetes mellitus. *Addict. Behav.* 26: 21-29.
11. Surwit, R.S., Van Tilburg, M.A., Zucker, N., Mc Caskill, C. C., Parekh, P., Feinglos, M.N., Edwards, C.L., Williams, P. and Lane, J.D. (2002). Stress management improves long term glycemic control in type 2 diabetes. *Diabetes Care.* 25: 30–34.
12. Williams E.D., Magliano D.J., Tapp R.J., Oldenburg B.F. and Shaw J.E.(2013). Psychosocial stress predicts abnormal glucose metabolism: the Australian diabetes, obesity and lifestyle study. *Ann Behav Med.*46(1):62–72. doi:10.1007/s12160-013-9473-y
13. Hackett R.A. and Steptoe A. (2017) Type 2 diabetes mellitus and psychological stress- a modifiable risk factor. *Nat Rev Endocrinol.* 13(9):547–560. doi:10.1038/nrendo.
14. Mussa, B.M, Schauman, M., Kumar, V., Skaria, S. and Abusnana, S. (2019). Personalized intervention to improve stress and sleep patterns for glycemic control and weight management in obese Emirati patients with type 2 diabetes: a randomized controlled clinical trial. *Dove Press Journal: Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy.*12: 991-999.

How to Cite This Article:

Agarwal Sonal and Sharma A K. Prevalence of stress and diabetes in the population of Bareilly District (U.P.). *Indian J. Biotech. Pharm. Res.* 2020; 8(3): 1 – 4.