Research Article

PREVALENCE AND RISK FACTORS OF ARTHRITIS:
A STUDY AMONG TYPE II DIABETIC PATIENTS; BANGLADESH PERSPECTIVE

Taslima Begum *, Amit Sarker, Md. Ashiqul Islam, Ashfia Fatima Khan
Department of Pharmacy, Primeasia University, Star Tower, 12 Kemal Ataturk Avenue, Banani, Dhaka-1213, Bangladesh
*Corresponding Author Email: amit.pharmacy30@gmail.com, taslima.begum@primeasia.edu.bd

ABSTRACT

The prevalence of arthritis in type II diabetic patients and its causative risk factors from this region is rarely found, where type II diabetes is in epidemic form. Total 410 patients were agreed to take part in this survey among them 361 were selected meeting all the selection criteria. The overall prevalence of arthritis in diabetic patients were 89 %, among them males were found 1.016 times more likely to develop arthritis (95% CI, 0.9322 and 1.107; p=0.3566) than the females. Risk ratio increased to 1.267 (95% CI, 1.07 to 1.5) for the age group higher than 50 years than the low age group (p=0.00003). On the other hand, there was not any association between insulin treatment and arthritis development was found in type II diabetic patients. However insulin treatment was found to develop weight gain in female patients (OR, 3.949; 95% confidence interval, 0.4443 to 35.1) compared to hypoglycemic drug treated patients.

Keywords: Type II diabetes, Arthritis, Insulin treatment, Body Mass Index

INTRODUCTION

Bangladesh is country with growing numbers of metabolic disordered patient. Health care is mainly delivered by the Government hospitals and by some non government organizations (NGOs), where as the diabetic care is solemnly provided here by the affiliated associations of diabetic association of Bangladesh (DAB). The distribution of diabetes mellitus (DM) is 8.1% and 2.3 % in urban and rural areas respectively here [1], and its prevalence is predicted to be increasing in number. Increased incidence of rheumatoid arthritis and its distribution is appeared in different population based study and hardly any ethnic group will be found to be free from it [2]. Osteoarthritis (OA) is a growing burden of pain and disability, occurring mainly in the hip and knee. There are few studies related to the prevalence of arthritis and DM in Bangladesh, therefore, attention should be paid to disclose the unknown risk factor in it. Osteoarthritis (OA) is thought to be involved in joint pain of non-inflammatory origin. However many evidence point toward inflammation as the symptom and disease progress attributed to OA [3, 4, 5]. Yet again many groups has reported the systemic inflammation is the predisposing factors of with Type II diabetes, where the mechanisms were-developing resistance through increasing interleukin-6 and C reactive protein, being low level of serum albumin for prolong period and higher WBC count [6, 7]. Present study describe the prevalence and causative risk factors (gender, age, insulin treatment) of arthritis in diabetes population (type II), so that, preventive measures can be improved.

MATERIALS AND METHODS

Representative patients

Only the out patients of Birdem General Hospital, Shahbag, Dhaka and Bangladesh Institute of Health Sciences (BIHS) Mirpur, Dhaka, Bangdesh, within June and July, 2013, were asked to participate in this survey work. Finally 361 number of type II diabetes with or without arthritis patients, both male and female and of all ages were selected apart from alcoholic, cerebral vascular disordered, hypothyroid, and patients with neoplastic disorders. Patients' diseased condition (inclusion and exclusion criteria) was first met by asking, and then confirmed by examination of their prescription and diagnostic report given by the medical doctors. Patient's height, current weight, fasting blood glucose level, and prescribed drugs etc were collected from their medical record book. To calculate the body mass index (BMI) following formula was exercised (BMI=Weight/Height^2). WHO defined threshold was taken as underweight being < 18.4 Kg/m^2, normal as 18.5 to 24.9 Kg/m^2, overweight being 25-29.9 and obese as > 25 Kg/m^2.

Statistical analysis

Results are presented as relative risks or odds with 95 % confidence interval. The risk ratio, odds ratio and confidence interval are calculated using Open epi V_37 and compared using an exact mid P statistic. P< 0.05 was considered as significance at each 2-tailed test.

Table 1: Patient groups based on their BMI and the drug treatment

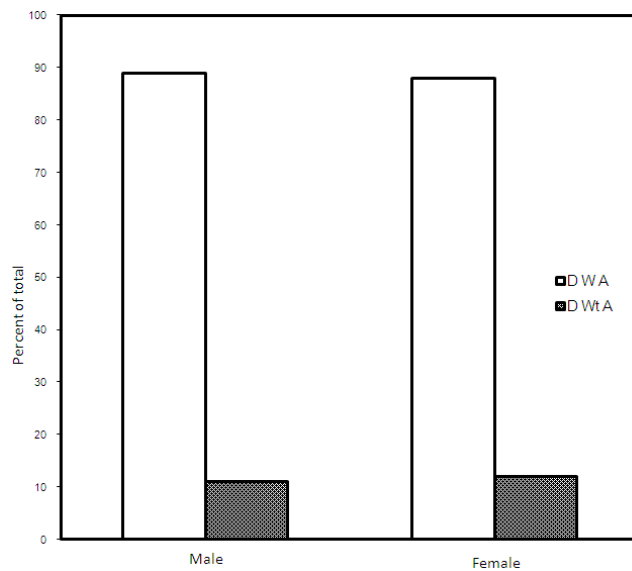|	Diabetes without arthritis	Male (Insulin treated)	Male (Tablet treated)	Female (Insulin treated)	Female (Tablet treated)
Within Normal range:	6.37 %	24.93 %	18.83%	7.48 %	12.18 %
Overweight range:	2.77 %	8.58 %	7.20 %	3.32%	1.38 %

Figure 1: Percent of male and female type II diabetic patients with(DWA)/without arthritis (DWt A). Values are given as percent of total
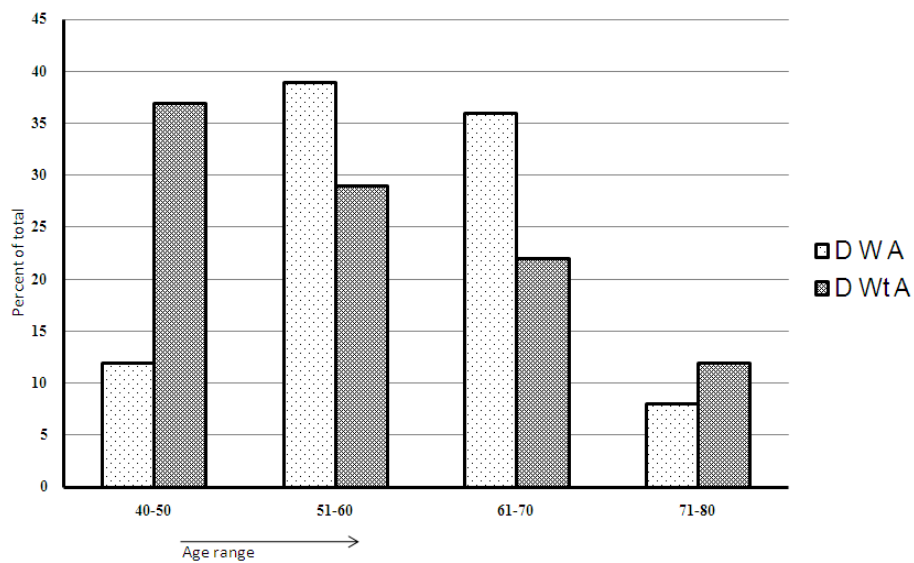

Figure 2: Relative distribution of arthritis among diabetic patients with age related strata. Values are presented by the percent of total.
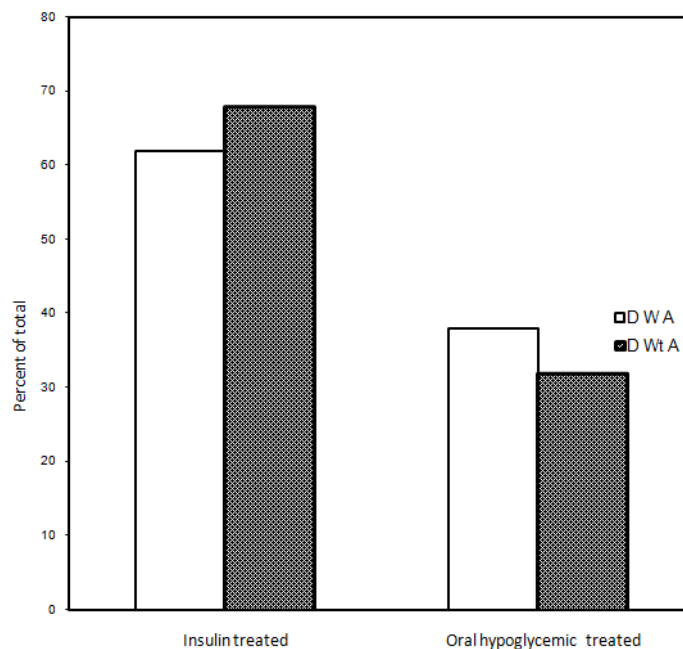
Figure 3: Comparative distribution of diabetic patients treated either by insulin or oral hypoglycemic, where values are presented as percent of total.

RESULTS AND DISCUSSION

Males were 1.016 times more likely to be arthritic than females among diabetic population. In addition, we are 95% confident that the true prevalence ratio is captured between 0.9322 and 1.107. And the odd of arthritis in males is 1.144 times the odds in females with a 95% confidence interval of 0.5585 to 2.343. Here the odds ratio is larger than the risk ratio, because the prevalence of arthritis among diabetic patients is higher (320/361=89%). Insulin treated group are less prone to develop arthritis than the drug treated group, risk ratio is 0.9681 with a 95% confidence interval 0.8994 to 1.042. And the odds ratio is 0.7436 (Confidence limits, 0.371 to 1.49).

Bangladesh is facing the high prevalence rate of DM, accounting 2.3 % and 8.1 % respectively in rural and urban areas [7], indicating The prevalence of arthritis among diabetic patients appeared to be 89% and interestingly both male and female counterpart have the same prevalence rate (Figure 1). However male type II diabetic patients are more prone to develop arthritis. Males are 1.016 time more likely to be affected that the females; the 95 % confidence interval around the estimate is 0.9322, 1.107. In a population based study about 27% of rural Bangladeshi population was shown to suffer from hip and knee pain, where DM was not considered. Report from other Asian countries reveled osteoarthritis in Pakistan 13.7% among rural community [8].

If those patients are stratified according to their age, most of the arthritic patients fall within 50-70 years of age, interestingly, a steady decrease with age was observed in patients with diabetes without arthritis (Figure 2). But comparing the age group below 50 and above we found that higher aged (> 50) patients are 1.267 times more chance to develop arthritis the confidence (CI- 1.07 to 1.5) and the Odds is 4.157 times than the low age group (CI- 2.027 to 8.525). We didn't consider the onset of diabetes in our subjects, for that reason we couldn't correlate this relationship with long or short onset of diabetes here.

Among the study subjects, most were taking insulin where the numbers of arthritic patients are 5% higher than the diabetic patients without arthritis but this difference disappeared among those oral hypoglycemic dependent diabetic patients (Figure 3). Initially we presumed that the insulin treatment may be a risk factor for the increased incidence of arthritis in diabetic population, since insulin treatment practice increased steadily for the last couple of years as a consequence of free of cost or subsidized insulin supply to poor and needy patients by a welfare system of BIRDEM hospital. However the prevalence rate of arthritis is shown to exist less in insulin treated patients than the oral hypoglycemic treated type II diabetic patient group (OR 0.7436, 95% CI 0.371 to 1.49). Furthermore, it appears that insulin treatment didn't cause weight gain for male (OR 0.9001, 95% CI 0.2829, 2.863). However, it causes weight gain of 3.949 time the odds in oral hypoglycemic treated female patients (95% confidence interval, 0.4443 to 35.1) (Table 1).

From the abovementioned data a close relationship between arthritis and DM is appearing. There are many evidences regarding the formation of proinflammatory cytokines in inflammatory condition and consequently type II diabetes mellitus formation by developing the insulin resistance [9, 10] but this question was not addressed directly in any studies. Again inflammatory pain reduction was attained by reducing blood glucose level [11]. Inflammatory pain and blood glucose level are interrelated. A large scale population based study with controlled potential confounders is necessary, in order, to get a clearer insight about which one is the predisposing factor.

Since it was a randomized control study and there were different aged participants so the findings can be generalisable to other diabetic patient group. However, the result is not conclusive because some possible confounders were not controlled and small sample size. Furthermore, our data suggest that the prevalence of arthritis is very high in diabetic population. And age accounts the most significant risk factor (p= 0.00003), followed by gender where male (p= 0.3566)) are more prone to develop arthritis in type II diabetic patients. But insulin treatment was not appeared to be a causative risk factor here.

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