Original Article

Increased Risk of Hip Fracture in Diabetic Elderly

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ABSTRACT

Objective: To investigate the relationship between diabetes mellitus (DM) and risk of hip fracture in older people in Taiwan
Design: Retrospective cohort study using the database for the period 1998 - 2010 from the Taiwan National Health Insurance Program
Setting: Taiwan National Health Insurance program
Subjects: There were 16,249 individuals aged 65 years or older with newly diagnosed DM as the diabetes group and 64,996 individuals without DM as the none-diabetes group.
Main Outcome Measures: The risk of hip fracture in both groups
Results: The diabetes group had a significantly higher incidence of hip fracture than the non-diabetes group (1080 Vs 859.6 per 100,000 person-years, incidence rate ratio 1.26, 95% CI 1.20, 1.31).
Conclusions: DM is associated with 1.26-fold increased risk of hip fracture in older people in Taiwan. Older people with DM should be closely followed to reduce the risk of hip fracture.

INTRODUCTION

Hip fracture is a significant health challenge in older people worldwide. Extensive studies have demonstrated that diabetes mellitus (DM) is a risk factor for hip fracture, with 1.4 to 1.98-fold increased risk[1-3]. So far, only few clinical studies have focused on the association of DM and risk of hip fracture in older people in Taiwan[4]. Therefore, we conducted this cohort study to investigate this issue by utilizing the database for the period 2000 - 2010 from the Taiwan National Health Insurance Program. The details of insurance program can be found in previous studies[5,6].

SUBJECTS and METHODS

In this cohort study, there were 16,249 individuals aged 65 years or older with newly diagnosed DM as the diabetes group based on the International Classification of Diseases, 9th Revision-Clinical Modification (ICD-9 codes 250, 8357 male and 7892 female, mean age [standard deviation, SD] = 73.2 [6.2] years, mean follow-up period [SD] = 5.2 [3.6] years) and 64,996 individuals without DM as the non-diabetes group (33,428 male and 31,568 female, mean age [SD] = 72.5 [6.7] years, mean follow-up period [SD] = 5.5 [3.7] years), from the period 1998 to 2010. Both groups were well-matched as regards sex, age and the year of diagnosis of DM and were followed up for the incidence of hip fracture (ICD-9 codes 820), until hip fracture was diagnosed or until December 31, 2010. Individuals with hip fracture diagnosed before entering this cohort were excluded.

RESULTS

The DM group had a significantly higher incidence of hip fracture than the non-diabetes group (1080 Vs 859.6 per 100,000 person-years, IRR [incidence rate ratio] 1.26, 95% CI 1.20-1.31). With further stratification by sex, age and follow-up period, the incidence rates of hip fracture were all higher in the diabetes group than in the non-diabetes group, with statistical significance. Female diabetic individuals had a higher risk of hip fracture than male diabetic individuals (IRR 1.33 Vs 1.16). Diabetic individuals aged 75 – 84 years had the highest incidence than other sub-groups (incidence

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rate = 1893.9 per 100,000 person-years). The risk of hip fracture was higher among individuals with diabetes duration ≥ 5 years (IRR 1.37, 95% CI 1.28 - 1.46), as compared to individuals with diabetes duration < 5 years (IRR 1.20, 95% CI 1.14-1.26) (Table 1). The difference of cumulative incidence of hip fracture between the diabetes group and the non-diabetes group increased with follow-up period (Fig. 1).

<table>
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</table>

Fig. 1: Cumulative incidence of hip fracture for diabetes and non-diabetes group

DISCUSSION

To date, extensive evidence has shown that individuals with DM are at higher risk of hip fracture. A systematic review by Janghorbani et al has shown that the risk of hip fracture incidence is higher among diabetic patients (risk ratio = 1.7 - 6.3)[7]. In our study, the incidence rate ratio of hip fracture was 1.26 in diabetic individuals, as compared to those without diabetes. Despite confounders related to hip fracture not being adjusted, our findings were compatible with previous studies[1-3]. A cohort study by Koh et al in Singapore reported that there is a strong dose-response relationship between diabetic duration and risk of hip fracture[3]. Furthermore, we also found that the risk of hip fracture is 1.2-fold in individuals with diabetic duration < 5 years (95% CI 1.14-1.26) and up to 1.37-fold in individuals with diabetic duration ≥ 5 years (95% CI 1.28-1.46). That is, the longer the diabetic duration, the higher risk of hip fracture.

CONCLUSION

DM is associated with 1.26-fold increased risk of hip fracture in older people in Taiwan. Since hip fracture is a multi-factorial disorder, at least, older people with diabetes mellitus should be closely cared for due to high risk of hip fracture.

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REFERENCES


