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Introduction

Diabetes mellitus has been associated with the incidence of back pain. However, the relationship between markers of diabetes progression and back pain has not been studied. The objective of this study is to correlate clinical and laboratory measures of diabetes disease severity to the presence of back pain and provide insight into the relationship between these conditions.

Methods

A total of 67,132 patients within our institutional database were identified as having the diagnosis of either DM type I (DMI) or DM type II (DMII). Within this larger cohort, patients diagnosed with chronic back pain (CBP) were identified. In addition, patients with a history of spinal surgery were also identified. Clinical and laboratory measures of diabetic disease burden were then collected on all patients. Multinomial logistic regression analysis using a backward stepwise selection algorithm was then implemented for multivariable analysis to determine whether patient variables were associated with the diagnosis of CBP or history of spinal surgery among diabetic patients.

Results

On unadjusted analysis, the mean duration of time since initial diabetes diagnosis increased in a stepwise fashion from patients without back pain (2554.6 days) to patients with back pain but no history of spinal surgery (2856.97 days) to patients with both back pain and a history of surgery (3065.7 days, p<0.001). The incidence of hypertension, diabetic neuropathy, and diabetic retinopathy was greater among patients with back pain (p<0.001). Highest recorded BMI was greater in patients with back pain (36.67) and patients with back pain who underwent surgery (36.63) compared to patients without back pain (34.06, p<0.001). Highest recorded values of hemoglobin A1C, LDL, triglycerides, and total cholesterol were significantly greater in patients with diabetes and back pain. Highest recorded value of HDL was significantly lower in patients with diabetes and back pain. On multinomial logistic regression analysis, increased levels of HgbA1C, LDL, and triglycerides, and decreased levels of HDL were associated with the presence of back pain independently of patient age and BMI.

Conclusions

Our results suggest that markers of diabetes disease progression are associated with the presence of back pain, indicating that uncontrolled diabetes may contribute to the development of chronic back pain.

Learning Objectives

By the conclusion of this session, the readers should be able to understand the connection between markers of diabetes progression and low back pain development.

References

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Results of multivariable analysis

Variable	Diabetics with LBP, no surgery				Diabetics with LBP, had surgery			
	Odds Ratio	Lower 95% CI	Upper 95% CI	P-Value	Odds Ratio	Lower 95% CI	Upper 95% CI	P-Value
Diabetes Mellitus Type II	0.251	0.091	0.411	0.002	0.24	-0.212	0.693	0.289
Female	0.332	0.265	0.399	<0.001	-0.018	-0.206	0.17	0.848
Neuropathy	0.282	0.194	0.369	<0.001	0.995	0.787	1.204	<0.001
Retinopathy	-0.016	-0.11	0.078	0.737	-0.471	-0.716	-0.225	<0.001
Hypertension	0.359	0.264	0.454	<0.001	0.852	0.514	1.189	<0.001
Insulin Use	-0.2	-0.274	-0.127	<0.001	0.057	-0.146	0.26	0.582
Metformin Use	0.116	0.046	0.187	0.001	0.378	0.175	0.58	<0.001
Age at Diabetes Mellitus Diagnosis	0.01	0.007	0.013	<0.001	0.007	-0.0004	0.015	0.063
Time with Diabetes Mellitus (Days)	0.0002	0.0001	0.0002	<0.001	0.0004	0.0003	0.0005	<0.001
BMI	0.018	0.015	0.022	<0.001	0.01	0.001	0.02	0.036
Maximum HgbA1C	0.055	0.037	0.073	<0.001	-0.028	-0.81	0.024	0.292
LDL	0.004	0.003	0.004	<0.001	0.004	0.003	0.005	<0.001
HDL	-0.007	-0.01	-0.004	<0.001	-0.013	-0.022	-0.004	0.004
Triglycerides	0.0001	0.00005	0.0002	0.002	0.0003	0.0001	0.0004	0.001