

Evaluating the Association between Obesity and Development of Trigger Finger and Carpal Tunnel Syndrome

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INTRODUCTION:

Obesity is known to cause a low-grade inflammatory environment that can influence development of musculoskeletal disorders. The impact of obesity is known in osteoarthritis but there is limited information on obesity-associated upper extremity pathology. We hypothesized that patients with high BMI will develop carpal tunnel syndrome or stenosing tenosynovitis sooner than patients with normal BMI.

METHODS: A retrospective chart review was performed for adult patients diagnosed with carpal tunnel syndrome (CTS) or stenosing tenosynovitis (TF) between January 2016 and December 2020 at a large outpatient academic practice. Inclusion criteria were patients over the age of 21, a diagnosis of CTS or TF, and a BMI history of at least 3 years. Exclusion criteria were patients under 21, traumatic etiology of CTS or TF and/or less than 3 years of documented BMI. The primary outcome was age at diagnosis of CTS or TF. A high BMI was considered 30 and above while a normal BMI was 18.5 to 24.9. We collected a number of covariates: laterality, number of corticosteroid injections, smoking status, diabetes, and HTN. Summary statistics were produced for the covariates of interest then compared between normal and high BMI groups. A stepwise multivariate linear regression model compared the impact of BMI on age of CTS or TF diagnosis after adjusting for co-variables known to accelerate CTS or TF development.

RESULTS:

A total of 262 patients met the inclusion criteria. Our univariate analysis showed that patients with high BMI developed CTS or TF an average of 6.4 years (95%CI: 1.9, 10.9, P=0.0053) earlier compared to the normal BMI group, 67.5 and 61.1 years respectively. Our multivariate model found that in the presence of other co-variables, high BMI caused development of CTS or TF 6.2 years sooner than patients with normal BMI (P<0.05). Additionally, current smokers developed CTS or TF 12.5 years sooner than never smokers (P<0.05). Patients with type 1 diabetes developed CTS or TF 18.8 years sooner than non-diabetics (P<0.05). Interestingly, patients with hypertension developed CTS or TF 6.0 years later than those without hypertension (P<0.05).

DISCUSSION AND CONCLUSION:

Patients with high BMI were diagnosed with CTS or TF at a younger age than normal BMI patients after adjusting for other causative co-variables. Smoking and Type 1 diabetes both have profound effects on age of diagnosis of CTS or TF. Obesity is associated with accelerated development of carpal tunnel syndrome and trigger finger after adjusting for other associated factors. These study results highlight the need for more bench research to investigate underlying inflammatory mechanism of CTS and TF.

Table 1: Demographics and Clinical Parameters by BMI group

	Normal BMI	High BMI (30+)	Combined	P<0.05
Age (years)	67.5 (13.9)	61.1 (12.6)	62.2 (13.0)	0.0053
Sex (% Female)	84.6%	79.3%	81.4%	0.308
BMI	23.1	31.8	30.1	<0.001
CTS (n)	16	75	91	0.293
TF (n)	36	132	168	0.247
Type 2 Diabetes (n)	6 (14.0%)	57 (33.0%)	63 (29.2%)	0.107
EMG Utilization for CTS (%)	4 (33.3%)	45 (60.0%)	53.8%	0.125
CTS Right Side	5 (16.1%)	26 (83.9%)	31 (100%)	0.872
CTS Left Side	2 (13.3%)	13 (86.7%)	15 (100%)	
CTS Bilateral	9 (19.6%)	37 (80.4%)	46 (100%)	
CTS Injections	0.39	0.52	0.49	0.6286
Trigger Injections	2.71	2.72	2.72	0.9848

Table 2: Multivariate regression analysis illustrating accelerated development of CTS and TF in the presence of other co-variables

	Coefficient	[95% Conf. Interval]	P<0.05
High BMI	-6.2	-10.6 -1.8	0.006
Smoking Status			
Never Smoker	Ref.	-	-
Current Smoker	-12.5	-20.8 -4.2	0.003
Former Smoker	3.4	-0.08 6.9	0.055
Occasional Smoker	8.6	-5.3 22.4	0.225
Diabetic Status			
Not diabetic	Ref.	-	-
Type 1	-18.8	-27.4 -10.1	<0.001
Type 2	-0.5	-4.4 3.4	0.799
Pre-Diabetes	3.4	-8.8 15.7	0.586
Hypertension	6.0	2.4 9.5	0.001
Intercept (Mean)	64.8	60.5 69.1	<0.001