

Ο σακχαρώδης διαβήτης ως παράγοντας κινδύνου εκφύλισης του μεσοσπονδύλιου δίσκου

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ΕΙΣΑΓΩΓΗ

Η συγκεκριμένη μελέτη παρουσιάζει την επίδραση του σακχαρώδη διαβήτη (DM), ως ξεχωριστό μηχανισμό, στην εκφύλιση του μεσοσπονδύλιου δίσκου (IVDD).

ΥΛΙΚΑ ΚΑΙ ΜΕΘΟΔΟΣ

Πραγματοποιήθηκε ανασκόπηση της βιβλιογραφίας για συλλογή δεδομένων, χρησιμοποιώντας τις βάσεις δεδομένων PubMed και Cochrane

Συνολικά βρέθηκαν 12 κλινικές μελέτες που συσχετίζουν τον DM και τις εκφυλιστικές βλάβες της σπονδυλικής στήλης όπως η IVDD, σπονδυλική στένωση (SS) και κήλη του μεσοσπονδύλιου δίσκου (IVD), και 34 εργασίες βασικής έρευνας που περιγράφουν τους παθοφυσιολογικούς μηχανισμούς μέσω των οποίων ο DM προκαλεί IVDD.

Υπάρχουν 7 μελέτες που συσχετίζουν τον DM με IVDD, 4 από τις οποίες δείχνουν ότι ο DM είναι ένας σημαντικός παράγοντας κινδύνου για εκφύλιση και 3 που δεν κατάφεραν να βρουν καμία αιτιολογική σχέση. Τρεις μελέτες δείχνουν σημαντική σχέση μεταξύ DM και SS.

Ωστόσο, 2 από αυτές τις μελέτες περιλαμβάνουν επίσης ασθενείς με IVD και δεν κατάφεραν να αποδείξουν οποιαδήποτε συσχέτιση με DM. Δύο άλλες μελέτες δείχνουν μια σημαντική συσχέτιση μεταξύ της κήλης και DM.

Πολλαπλοί διαφορετικοί μηχανισμοί, που δρουν ανεξάρτητα ή αλληλεπιδραστικά, προκαλούν ιστική βλάβη που οδηγεί σε IVDD, συμπεριλαμβανομένων: μικροαγγειοπάθεια της σπονδυλικής τελικής πλάκας, κυτταρική γήρανση, κυτταρικός θάνατος (μέσω απόπτωσης ή αυτοφαγίας), υπεργλυκαιμία, τελικά προϊόντα γλυκοζυλίωσης, λιποκίνες και κυτοκίνες (μέσω οξειδωτικών, οσμοτικών και φλεγμονωδών μηχανισμών).

ΑΠΟΤΕΛΕΣΜΑΤΑ

No. References	Study design/level of evidence	Population	Methods	Outcomes	Strength/limitation
1. Agius et al.	Cross-sectional, 2 branches with control/II	100 pts DM versus 86 pts non-DM	Relationship between BMD, IVD height, BP, OVF risk versus DM	No significant independent association between DM and BMD Significant association between narrowed IVD and DM DM is a significant risk factor for IVDD and is not associated with BMD and OVF	Strength Limited sample but has 90% statistical power. High quality data Limitation IVDD not the only target. Significant age difference between 2 groups.
2. Jakoi et al.	Cross-sectional retrospective (Insurance industry database study)/III	280,399 pts with IVDD of which 14,114 pts with DM	IVDD correlation with DM, obesity, and smoking	DM, obesity, and cigarette smoking each are significantly associated with IVDD	Strength Large sample size Limitation Retrospective analysis of an insurance industry database study leaving room for coding error or code bias. Difficult to know if physicians were coding appropriately for IVDD. Data from a large private insurer (Humana) with customers nationwide, but no other insurers
3. Liu X, 2018	Retrospective study/III	150 pts without DM (group A) and 622 pts with DM (well-controlled group-B, n=380) and a bad-controlled group 242 pts	IVDD in pts without DM versus pts with well-controlled and bad-controlled DM	Patients with DM show more severe IVDD from L1-L2 to L5-S1 after removal of age effects (p<0.05). DM duration > 10 years and a poor control of DM are predisposing risk factors for IVDD The longer the duration or poor control of DM the more severe the associated IVDD	Strength Satisfactory sample size Limitation Include pts with low back pain seeking therapy. Does not analyze the age differences between the groups. Retrospective study
4. Steelman et al.	Population retrospective case control study/III	160,911 pts with IVDD and 315,225 age and sex-matched controls in military members	IVDD associated risk factors: DM, obesity, smoking, hip and knee arthritis	The authors were able to identify a significant association between IVDD and: (a) DM an OR of 1.469 (CI), 1.350-1.598 (b) Hip and knee arthritis of OR 2.295 (CI), 2.685-3.187 (c) Tobacco dependency of OR 1.799 (CI), 1.308-1.36 (d) Obesity of OR 1.556 (CI 1.497-1.618)	Strength Large sample size Limitation IVDD not the only primary target. Retrospective study
5. Hangai et al.	Cross-sectional elderly population/III	231 pts without DM versus 36 pts with DM	IVDD versus DM (HbA1c) Primary study: Association between IVD and CV risk factors. Secondary study: Association between high BMI, high LDL, smoking, drinking, DM	No significant independent association between IVDD and DM. HbA1c used as a biochemical marker for DM	Strength Satisfactory sample size Limitation IVDD not the primary target. DM diagnosed only based on HbA1c
6. Fabiane et al.	Cross-sectional control, twins, DM and IVDD incidence; twins discordant for DM, IVDD incidence/II	956 twins; 33 twins discordant for DM	IVDD versus DM, BMI, age, smoking, alcohol	6.6% of twins had DM IVDD score was higher in DM twins (4.9 vs. 13.1, p=0.04) but not an independent risk factor when age and BMI included. (80% power at 0.1 significance) Discordant twin analysis (n=33 pairs) showed no significant difference in IVDD between diabetic twins unaffected twins	Limitation IVDD not the only primary target. Limited sample size. Prevalence of females in the sample. The limited differences in HbA1c between cases and controls are suggestive of pre-diabetes in controls.
7. Videman et al.	Case control, MZ twins discordant for DM/III	9 pairs of monozygotic twins discordant for DM	DM versus BMD and IVDD MRI scans	IVDD did not differ between DM pts and their twins; after controlling for smoking, femoral neck BMD was 2.5% lower in DM than their twins (p=0.09)	Limitation IVDD not the only primary target. Small number of subjects
8. Asadian et al.	Cross-sectional, prospective, 3 branches with control group/II	110 pts with SS, 110 pts with IVD herniation. Control 110 pts without spinal pathology	SS and IVD herniation versus DM Association between DM, SS and IVD herniation	32 (29.1%) in the SS group, 7 (6.4%) in the IVD herniation group, and 11 (10%) in the control group DM in women with SS and women with IVD herniation was 35.9% and 10.3%, respectively, versus 10.9% in the control group Statistically significant in the SS group versus controls (p<0.0001). No significant difference was found in men	Strength High statistical power Limitation Bias due to greater number of women and under-power men. The IVD herniation group was younger than the other two groups, with too few participants in the > 60 age group, which might bias the diabetes prevalence assessment Poor correlation of the control group. Not investigate the duration of diabetes and the type of diabetes treatment
9. Anekstein et al.	Case control cross-sectional/II	395 pts with SS, IVD herniation, or OVF versus DM	Correlation between SS, IVD herniation, or OVF versus DM	The prevalence of DM in SS: 28% OVF: 6.5%, disc herniation: 12.1% DM is a statistical significant risk factor for SS (p=0.001) Prevalence of DM between SS and IVD herniation group is more pronounced in the younger age group	Strength Satisfactory sample size Limitation SS, IVD herniation, and OVF might simultaneously exist in the same patient
10. Maeda et al.	Cross-sectional, symptomatic SS in the general Japanese population/III	968 participants (319 men, 649 women), age 21-93 y, 92 symptomatic SS versus 876 asymptomatic SS.	Association of DM with symptomatic SS versus asymptomatic SS Comparison between moderate and severe MRI SS. DM assessment using HbA1c	DM is significantly associated with moderate SS (multiple logistic regression analysis p=0.0009). No significant association in subjects with severe SS (p=0.42) MRI used to evaluate stenosis Classification Canal narrowing Normal, Grade 1 No narrowing Mild, Grade 2 1/3 Moderate, Grade 3 1/3-2/3 Severe, Grade 4 > 2/3	Strength Satisfactory sample size Limitation DM assessment using HbA1c
11. Jhavar et al.	Case control, prospective longitudinal study/II	98,407 female nurses	Primary target: Correlation between CV risk and IVD herniation Secondary target: DM, cholesterol, hypertension, obesity, and myocardial infarction before the age of 55	Multivariate relative risk for DM is 1.52 IVD herniation is highly associated with DM, high cholesterol, hypertension, smoking, and myocardial infarction before the age of 55	Strength Satisfactory sample size Limitation DM not the primary target
12. Sakellariis	Prospective, control study/II	102 operated pts with IVD herniation versus 98 pts without IVD herniation operated for other reasons	IVD herniation association with DM	DM in 32% of pts with IVD herniation versus 13% of pts without IVD herniation DM predisposes to IVD herniation with compressive radiculopathy (32%) Yates-corrected $\chi^2=10.28, p=0.013$	Strength Prospective, high statistical power. Scatica attributed to IVD herniation and not to diabetic neuropathy Limitation Larger sample size would have been more convincing

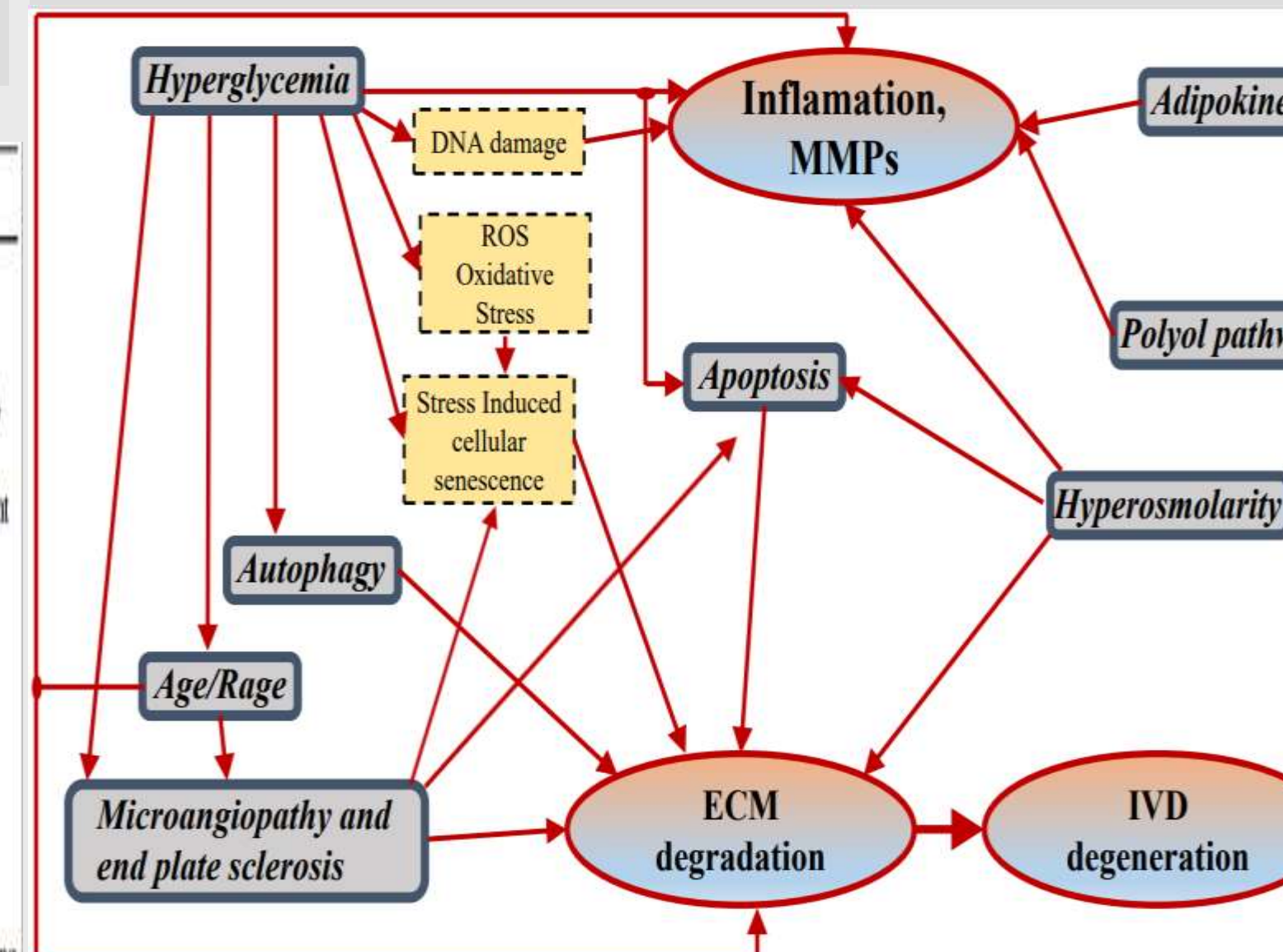
Πίνακας 1: Συσχέτιση του σακχαρώδη διαβήτη με την εκφύλιση του μεσοσπονδύλιου δίσκου και τη σπονδυλική στένωση

ΣΥΜΠΕΡΑΣΜΑ

ΣΥΜΠΕΡΑΣΜΑ: Τα στοιχεία από τις κλινικές μελέτες αν και αντικρουόμενα υποστηρίζουν ασθενώς τη σχέση μεταξύ DM και IVDD.

Ωστόσο, οι εργαστηριακές μελέτες υποδηλώνουν με συνέπεια ότι ο DM περιμβανεί σε πολλαπλές μοριακές και βιοχημικές οδούς που προκαλούν IVDD.

Συνολικά, τα ισχυρά εργαστηριακά στοιχεία και οι αδύναμες κλινικές μελέτες εμπλέκουν τον DM ως ξεχωριστό παράγοντα συμβολής για την IVDD



Εικόνα 1: Σχηματική απεικόνιση της εκφύλισης του δίσκου

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