Role of Cardiovascular Risk Factors in Symptomatic Lumbar Disk Herniation: Myth or Reality?

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Introduction:The intervertebral disk is the largest avascular tissue in the body and the nutrient supply is via capillary network. Whether cardiovascular risk factors (CVRFs) used as a surrogate for atherosclerosis might diminish this nutrient supply and lead to herniation as a result of the consequences of ischemia has been an interesting research area with several conflicting reports. Thus in our study we evaluated CVRF profile in patients with symptomatic lomber disk herniation (SLDH) to see whether such an interaction existed.

Methods:GI included 50 patients (mean age 41;25 women, 25 men) with unilevel SLDH and G II included 50 patients (mean age 41;25 women,25 men)with nonspesific headache.Patients with multiple disk herniation, spondilolizis, spondilolistesis, spinal stenosis, spondylarthritis,known hypertension,diabetes, consuming any kind of drug were excluded.Total cholesterol(TC),triglyceride(TG),LDL cholesterol(LDL-C),HDL cholesterol(HDL-C), blood glucose (BG)and HbA1C levels were obtained. TC/HDL-C was calculated. A careful history was taken for current/past smoking,alcohol or drug consumption.Waist circumference(WC) ,body mass index(BMI),systolic (SBP)and diastolic blood pressures(DBP) were measured . Statistical analysis was done by using IBM SPSS Statistics 22 programme .

Results: We paid special attention to include patients under 60 years to minimize the effects of aging and the mean age of women in GI and GII was reflecting the premenopausal period. We found that none of the patients were obese and the incidence of smoking and alcohol consumption was relatively small in both groups.When groups were totaly analysed there was no statistically significant difference between 2 groups regarding the parameters measured.(Table 1) ($p>0.05$).Our results were in contrast to Longo UG. et al (1) who showed that TG and TC levels increased in patients with SLDH.However when we analysed each group according to gender there was an interesting result.

In men in G-I TG (p:0.001), TC/HDL-C (p:0.001), SBP (p:0.006), DBP (p:0.018) levels were higher and HDL-C (p:0.001) was lower compared to men in GII (Table3).However this difference didnot exist between women in 2 groups (Table2).The findings of higher BP levels in men in GI was in concordance with Leiono Arjas P. et al (2) who showed that there was an association between BP and lumbar disc disorders (LDD) prominent in men.Consistent with our results for serum lipids Leino-Arjas P. et al (3) have also shown a more prominent association between TGs and TC and LDD in men (2,3). As known there are gender differences between men and women for coronary artery disease (CAD)such as men develop CAD about 10 years earlier than women (4) and CVRFs such as smoking, hypertension, and hypercholesterolemia are more common among men (4).

CVRFs also differ between women according to menapausal status due to the protective effects of estrogen. which raises HD and lowers total and LDL-C levels (5).

Conclusions:To prove the atherosclerosis-lumbar disc herniation hypothesis the impact of CVRFs should be avaluated individually and in the context of gender differences in atherosclerosis. Taking anttropometric and hormonal differences into account and involving more patients with longer duration of followup will be the art of choice.

References1) Longo UG, Denaro L,et al.Symptomatic disc herniation and serum lipid levels. Eur Spine J. 2011;20: 1658-62. 2) Leino-Arjas P, Solovieva S,et al. CRF and low-back pain in a long-term follow- up of industrial employees. Scand J Work Environ Health 2006;32(1):12 -9. 3)Leino-Arjas P, Kaila-Kangas L,et al. Serum lipids and low back pain: an association? A follow-up study of a working population sample. Spine 2006;31: 1032 -7. 4) Kröger K, Suckel A,et al. Different prevalence of asymptomatic atherosclerotic lesions in males and females. Vasc Med.1999;4(2):61-5. 5)Keser N,et al. Stroke in women.In:Nanda NC,Keser N Eds.Heart disease in women.India:Jaypee Brothers Med. Pub; 2015. pp.64-9.

Table 1:
Evaluating the operating parameters according to the study (G-I) and control (G-II) groups in all cases

All Cases	G-I Mean±SD	G-II Mean±SD	p
Anthropometric Measurements			
[1]Age	41,12±1,16	41,38±1,41	0,887
[1]BMI	27,95±0,66	28,79±0,56	0,332
[1] Waist Circumference	95,74±1,77	96,76±1,44	0,656
[1]FBS	96,7±14,42	94,44±7	0,322
[1]HbA1C	5,43±0,47	5,4±0,31	0,651
[1]SBP	124,6±13,06	122,78±15,5	0,527
[1]DBP	75,64±9,82	74,96±10,31	0,736
[1]TC	198,38±41,27	199,1±41,29	0,931
[2]TG	132,76±65,83(113)	134,58±69,89 (112,5)	0,863
[1]LDL-C	131,9±35,31	129,88±32,76	0,767
[1]HDL-C	40,38±9,5	43,28±9,17	0,124
[1]TC/HDL-C	5,09±1,29	4,28±1,57	0,344
[3]Smoking n,%			
Yes	13 (%26)	18 (%36)	0,387
No	37 (%74)	32 (%64)	
[4]Alcohol consumption n,%			
Yes	3 (%6)	3 (%6)	1,000
No	47 (%94)	47 (%94)	

[1]Student t Test [2]Mann-Whitney U Test [3]Continuity (Yates) Dizelmesi [4]Fisher's Exact Test

SBP: Systolic Blood Pressure; DBP: Diastolic Blood Pressure; FBS: Fasting Blood Sugar; TC: Total Cholesterol; TG: Triglycerides; LDL-C:LDL- Cholesterol; HDL-C:HDL- Cholesterol; TC/HDL-C: Total Cholesterol / HDL- Cholesterol

Table 2: Evaluating the operating parameters according to the study (G-I) and control (G-II) groups in women

Females	G-I Mean±SD	G-II Mean±SD	p
AnthropometricMeasurements			
[1]Age	41,0±8,01	42,36±11,47	0,629
[1]BMI	28,78±4,62	28,11±3,11	0,548
[1]Waist Circumference	95,56±11,91	99,04±8,55	0,241
[1]FBS	98,12±16,18	94,8±7,78	0,362
[1]HbA1C	5,41±0,5	5,38±0,29	0,809
[1]SBP	120,52±11,72 (120)	128,56±13,52 (130)	0,029*
[1]DBP	72,92±7,88 (70)	79,08±8,2 (80)	0,009**
Serum Lipids			
[1]TC	189,20±39,08	200,64±44,98	0,342
[2]TG	99,52±25,40 (95)	168,12±81,36 (147)	0,001**
[1]LDL-C	126,85±32,66	128,98±36,5	0,828
[1]HDL-C	43,36±10,01	38±6,98	0,033*
[1]TC/HDL-C	4,52±1,41	5,49±1,79	0,027*
[3]Smoking n,%			
Yes	8 (%32)	11 (%44)	0,560
No	17 (%68)	14 (%56)	
[4] Alcohol consumption n,%			
Yes	1 (%4)	3 (%12)	0,609
No	24 (%96)	22 (%88)	

[1]Student t Test [2]Mann-Whitney U Test [3]Continuity (Yates) Dizelmesi [4]Fisher's Exact Test
**p<0.05 **p<0.01*

Table 3: Evaluating the operating parameters according to the study (G-I) and control (G-II) groups in men

Males	G-I Mean±SD	G-II Mean±SD	p
AnthropometricMeasurements			
[1]Age	41,24±8,56	40,4±8,33	0,727
[1]BMI	27,11±4,65	29,46±4,57	0,077
[1]Waist Circumference	95,92±13,38	94,48±11,3	0,683
[1]FBS	95,28±12,58	94,08±6,28	0,672
[1]HbA1C	5,46±0,44	5,41±0,34	0,695
[1]SBP	128,68±13,28	117±15,43	0,006**
[1]DBP	78,36±10,93	70,84±10,69	0,018*
Serum Lipids			
[1]TC	207,56±42,13	197,56±38,12	0,383
[2]TG	166±76,82 (142)	101,04±31,78 (96)	0,001**
[1]LDL-C	136,96±37,75	130,78±29,27	0,521
[1]HDL-C	37,4±8,1	48,56±8,04	0,001**
[1]TC/HDL-C	5,67±1,18	4,15±0,94	0,001**
[3]Smoking n,%			
Yes	5 (%20)	7 (%28)	0,741
No	20 (%80)	18 (%72)	
[4] Alcohol consumption n,%			
Yes	2 (%8)	0 (%0)	0,490
No	23 (%92)	25 (%100)	

[1]Student t Test [2]Mann-Whitney U Test [3]Continuity (Yates) Dizelmesi [4]Fisher's Exact Test
**p<0.05 **p<0.01*