RISK FACTORS FOR RADIOLOGIC CERVICAL SPONDYLOSIS IN DUHOK: A CASE CONTROL STUDY

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ABSTRACT

Background and Objective: Cervical spondylosis is a broad term usually used to denote a chronic degenerative condition generally ascribed to progress in age and other possible risk factors. The disease is common and may lead to possible neurological deficits. There is thus a clear need for identifying its probable risk factors in order to better understand their control and prevention.

Patients and methods: A case control study conducted at Duhok's Center for Rheumatic Diseases during the period1st April - 30th September, 2014. Depending on the presence of symptoms and radiologic findings, 129 patients were selected and registered as 'cases' and another 129 patients without radiological abnormalities were collected and registered as 'controls'. For each participant age, gender, marital status, weight, height, smoking status, family history, drug use and number of pillows were recorded. In addition, for men, the history of wearing Kurdish turban (Shashek) was recorded. The increased risk was estimated by calculating the odds ratio and 95% CI.

Results: Overall, age was found the most significant risk factor in both genders (OR13.55). For women, the highest odds ratio related to chronic drug use (OR 4.01) followed by BMI (OR 3.44) and sedentary work (OR 2.64). For men, the highest odds ratio related to Shashek use (OR 16.8) followed by sedentary work (OR 5.6) and smoking (OR 4.18). Physical activity of $\geq$ 150 min/week gave a statistically significant negative association in both men and women (OR of 0.34 and 0.18 respectively with a p value <0.05).

Conclusions: Radiological cervical spondylosis is positively associated with aging and sedentary work in both genders. Significant positive associations were found with chronic drug use and high BMI in women compared to significantly high association with the Kurdish male turban (Shashek) and smoking in men.

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Keywords: BMI, cervical spondylosis, Duhok, physical activity, risk factors, shashek, smoking

C ervical spondylosis (CS) is a broad term usually used to denote a chronic degenerative condition generally ascribed to progress in age. This condition affects the vertebral body, the intervertebral disc and the facets as well as other soft tissues supporting these joints.[1]

It presents itself in several clinical syndromes, sometimes clearly separated and distinct, others quite overlapping. These are: a) neck pain usually associated with pain in the shoulder, b) radiculopathy and c) myelopathic symptoms[2]. Most research papers stressed on advancing age

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as the risk factor which is most important as a cause for CS3. Besides, there are other possible risk factors such as overweight 4,5 and smoking[6]. There is also a presumed role for heredity, especially in regard to cervical spondylotic myelopathy[7,8] and carrying loads on the head[9,10,11]. Neck pain is so common as to be considered a public health problem[12]. In the United States at least one person of every hundred who visits a primary care center does so because of neck pain and nearly 70% of the population have suffered or will suffer this symptom, one time in their life[13]. Due to paucity of local studies in this context, this study has been conducted to assess some potential risk factors for radiologic cervical spondylosis among residents of Duhok.

PATIENTS AND METHODS

The study was conducted at Duhok Center for Rheumatic Diseases (DCRDs) during the period from the 1st of April to the 30th of September 2014. The DCRDs is a specialized, governmental, tertiary health-care center to which patients are referred from all primary and secondary heath centers of Duhok for rheumatologists consultation. Included subjects were symptomatic adults aged $\geq$ 20 years of both genders, suspected of having cervical spondylosis, who were referred to DCRDs, during the study period, for rheumatologist's consultation. Exclusion criteria included rheumatoid arthritis, multiple sclerosis, trauma to the neck or head, syringomyelia, severe osteoporosis, tumor of the neural elements, meninges or vertebrae (primary or secondary), amyotrophic lateral sclerosis, spinal cord infarction, sub acute combined degeneration of the spinal cord, normal pressure hydrocephalus.

A consecutive sampling procedure was used to enroll 129 patients with x-ray findings consistent with cervical spondylosis as "cases" and 129 x-ray negative persons were selected as "controls" and registered similarly. The final study sample size amounted to 258 adults including 61 men and 197 women, all muslim and kurdish. A specially designed questionnaire was prepared to document the required data. It included demographics, presenting symptoms, potential risk factors and radiographic findings. Data were analyzed using SPSS (version 22nd / 2013).

RESULTS:

The sample consisted of 258 adults whose ages ranged from 20 years to 60+ years, of whom 61 were men and 197 were women. The age group 30-49 years included 50% of all the participants .Most subjects were married (85.5%), others were still single, widowed or divorced. There was no statistically significant difference between men and women regarding age and marital status. The other findings are presented in the following tables.

Table 1. Cases and Controls by Gender

		Cases		Controls		Total	P*
		No.	Percent	No.	Percent	No.	
Gender	Men	32	52.5%	29	47.5%	61	0.660
	Women	97	49.2%	100	50.8%	197	

* Chi-square test

Table 2. Cases and Controls by Age

			Cases (n=129)		Controls (n=129)		Total (n=258)	Odds Ratio (95% CI)*	P*
			No.	(%)	No.	(%)	No.		
Male	Age	20-39 years	2	(6.3)	23	(79.3)	25	57.5 (10.61-311.6)	<0.001
		≥ 40 years	30	(93.7)	6	(20.7)	36		
Female	Age	20-39 years	18	(18.6)	69	(69.0)	87	9.77 (5.023-18.99)	<0.001
		≥ 40 years	79	(81.4)	31	(31.0)	110		
Both	Age	20-39 years	20	(15.5)	92	(71.3)	112	13.55 (7.36-24.96)	<0.001
		≥ 40 years	109	(85.5)	37	(28.7)	146		

* Binary logistic regression.

Table 3. Cases and controls by BMI and Gender

			Cases (n=129)		Controls (n=129)		Total (n=258)	Odds Ratio (95% CI)*	P*
			No.	(%)	No.	(%)	No.		
Male	BMI	<25 kg/m2	8	(25.0)	12	(41.4)	20	2.12 (0.71-6.29)	0.177
		≥ 25kg/m2	24	(75.0)	17	(58.6)	41		
Female	BMI	<25 kg/m2	9	(9.3)	26	(26.0)	35	3.44 (1.52- 7.79)	0.003
		≥ 25kg/m2	88	(90.7)	74	(74.0)	162		
Both	BMI	<25 kg/m2	17	(13.2)	38	(29.5)	55	2.75 (1.46-5.19)	0.002
		≥ 25kg/m2	112	(86.8)	91	(70.5)	203		

* Binary logistic regression.

Table 4. Cases and Controls among Men by Weight and Height

	Total (n= 61)		Cases (n=32)		Controls (n=29)		P*	95% CI	
	Mean ± SD		Mean ± SD		Mean ± SD			Lower	Upper
Weight	77.13	±14.90	78.06	± 14.7	76.10	±15.26	0.612	-5.73	9.65
Height	1.68	± 0.08	1.67	± 0.09	1.70	± 0.08	0.200	-0.07	0.02

* Unpaired t-test.

Table 5. Cases and Controls among Women by Weight and Height

	Total (n= 197)		Cases (n= 97)		Controls (n= 100)		P*	95% CI of difference	
	Mean ± SD		Mean ± SD		Mean ± SD			Lower	Upper
Weight	74.29 ±	15.84	78.25	± 14.88	70.45	±15.87	<0.001	3.47	12.12
Height	1.56	± 0.06	1.55	± 0.05	1.57	±0.07	0.014	-0.04	-0.01

* Unpaired t-test.

Table 6. Cases and Controls by Risk Factors among Men

Risk Factor		Cases No. (%)		Controls No. (%)		Total No.	Odds Ratio (95% CI)*	P*
Family History	Yes	5	(15.6)	6	(20.7)	11	0.71	0.608
	No	27	(84.4)	23	(79.3)	50	(0.19-2.63)	
Chronic Drug Use	Yes	7	(21.9)	2	(6.9)	9	3.78	0.117
	No	25	(78.1)	27	(93.1)	52	(0.72-19.94)	
Shashek Wear	Yes	12	(37.5)	1	(3.4)	13	16.80	0.009
	No	20	(62.5)	28	(96.6)	48	(2.02-139.85)	
Physical Activity	< 150 min/wk	19	(59.4)	6	(20.7)	25	0.18	0.003
	≥ 150 min/wk	13	(40.6)	23	(79.3)	36	(0.06-0.56)	
Smoking	Smoker	23	(71.9)	11	(37.9)	20	4.18	0.009
	Nonsmoker	9	(28.1)	18	(62.1)	27	(1.43-12.26)	
No. of Pillows	One	28	(87.5)	25	(86.2)	53	0.89	0.881
	Two	4	(12.5)	4	(13.8)	8	(0.20-3.95)	
Sedentary Work	Yes	19	(59.4)	6	(20.7)	25	5.60	0.003
	No	13	(40.6)	23	(79.3)	36	(1.79-17.56)	
Total		32	(100)	29	(100)	61		

*Binary logistic regression.

Table 7. Cases and Controls by Risk Factors among Women

Risk Factor		Cases No. (%)		Controls No. (%)		Total No.	Odds Ratio (95% CI)*	P*
Family History	Yes	38	(39.2)	33	(33.0)	71	1.31	0.367
	No	59	(60.8)	67	(67.0)	126	(0.73-2.34)	
Chronic Drug Use	Yes	47	(48.5)	19	(19.0)	66	4.01	<0.001
	No	50	(51.5)	81	(81.0)	131	(2.12-7.59)	
Physical Activity	< 150 min/wk	35	(36.1)	16	(16.0)	51	0.34	0.002
	≥ 150 min/wk	62	(63.9)	84	(84.0)	146	(0.17-0.66)	
Smoking	Smoker	9	(9.3)	5	(5.0)	6	1.94	0.250
	Nonsmoker	88	(90.7)	95	(95.0)	183	(0.63-6.02)	
No. of Pillows	One	88	(90.7)	87	(87.0)	170	0.68	0.409
	Two	9	(9.3)	13	(13.0)	22	(0.28-1.68)	
Sedentary Work	Yes	34	(35.1)	17	(17.0)	51	2.64	0.004
	No	63	(64.9)	83	(83.0)	146	(1.35-5.14)	
Total		97	(100)	100	(100)	197		

* Binary logistic regression.

DISCUSSION:

The findings revealed consistency of advancing age as a risk factor for CS, similar to the results of most available reports[3,2]. Singh et al. (2014) conducted a hospital-based case-control study on 200 hospital attendants in Lucknow, India. They found that age, occupation, female gender and short stature, were significant risk factors[14]. This strong CS-age relationship reflects the age-related intervertebral disk degeneration found by a number of investigators[15].

As to the BMI, the results showed an overall, statistically significant association with CS (p= 0.002). Differentially the association was significant in women (OR 3.44 and p= 0.003) but non-significant in men (p= 0.177). The difference of the effect of high BMI between men and women in the current study is a question to be studied by a more extensive research work in the future as the present literature points to a relationship between body fat and IVD degeneration without gender discrimination4,. The underlying cause of this apparent discrepancy between the two genders may be the small percentage of overweight subjects among men or probably because men are more active physically than women according to WHO[16] and physical activity proved in this study to be associated with a negative odds ratio.

According to the available literature, the investigator could not find studies that investigated the height in relation to CS, except the aforementioned study of Singh et al which found short stature as a risk for CS[16] The present study revealed a negative association between CS and height in women (p= 0.014 with a CI − 0.04 to− 0.01) but not in men (p= 0.20). This, again, is not readily amenable to explanation but it can be related to the fact that women in our sample were significantly shorter than men. Another possibility may be the confounder effect of the BMI difference between the two genders in our population that has been demonstrated.

Despite the fact that more women than men reported 'symptoms', direct association between the 'disease' and female gender has not been demonstrated in our study like in other studies e.g. Singh et al[14]. Contrary to that, differential gender analysis of age-associated risk revealed that men's OR exceeded markedly that of women. There could be more than one explanation to this finding and apparent difference between these two studies. The first one is the difference between both communities, the Indian and the Kurdish. While the present day Duhok's women lead, in general, a home-bound, relatively easy life with electricity-powered laundry machines, dish washers, sweepers, tap water, etc, the Indian women in general, one expects, lead a harder life, probably bearing heavy loads on their heads like Pakstani and Bangladishi women[17].

Chronic drug use showed a significant association with CS in women (OR 4 and p < 0.001) compared to the same parameter in men. This may be a reflection of the longer duration of symptoms in women: the longer the history, the more likelihood of drug use.

Despite reports in favor of strong genetic effect in neck pain and cervical

spondylosis[18], this study failed to show statistically significant association with the family history of patients. This may reflect underdiagnosis in the relatives of the patients, forgetfulness of the patients in the tense, crowded situation of outpatient (recall bias), or real absence of wide spread familial aggregation as Yoo and Origitano stated[19]. Anyhow the available literature which stresses the role of heredity in cervical spondylosis depends largely on studies of identical twins[20]. There is a logic objection on interpretations from twin studies, that is, the twins in most situations share the same environment[21].

Smoking displayed a statistically significant association with spondylosis only in men. This can be ascribed to a small percentage of smokers among women of the study sample. This, in turn, can be real or caused by a sort of denial caused by the socio cultural embarrassment of the stigma which is linked with smoking of women in a conservative Duhoki community, making women unwilling or reluctant to admit smoking. Takatalo et al (2013) found similar results in Finnish males connecting smoking to lumbar disk degeneration[22].

A novel factor which has been examined for the first time in the present study is the traditional Kurdish male head turban called "shashek". The shashek use proved to have a statistically significant association with cervical spondylosis (OR 16.8 and p= 0.009). This can be compared to the effect of bearing loads on head studied by other researchers[10,9] ,or a confounding effect of age as more aged men wear shashek.

As to physical activity, those who exercised at a rate $\geq$ 150 min/week were less prone to CS (OR 0.18 and p= 0.003) than others who exercise < 150 min/week. According to the WHO, about 3.2 million deaths per year globally are attributable to insufficient physical activity which is the fourth cause of mortality globally[16].

Study limitations included the following: Fist, the study sample was totally hospital based as it was wholly recruited from a tertiary health care center. Thus the gathered data may not have reflected the experience among the whole population. The other point is the difficulty of assessing occupational exposure accurately, as assessment relied on self-reporting of exposures not objective measures. In addition, the majority of subjects were women, whose majority were housewives.

In conclusion, radiological CS is positively associated with aging and physical inactivity in both genders. Female gender exhibited positive association with BMI and chronic drug use contrasting negative association with height. Kurdish turban and smoking showed a statistically significant association with radiological CS in men. Adoption of public educational programs to help control and prevention of the documented risk factors is suggested.

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پوخته

هۆکارێن مەترسییێ بو ژنافچوونا دوومدرێژ یا بریرا ستوی لدهوکی: ڤەکولینەکا بەراوردییا نەخوش وساخلەما

پێشەکی: بریرا ستوی ناڤ و نیشانەکیێ درێژه ئاماژه ب بواریێ ژنافچوونا دوم درێژ ب رەنگەکیێ گشتی پێشڤەبووی د تەمەنیدا تـوش دبن زێدەباری هۆکارێن مەترسیا پەیدا دبیت. ئەو نەخۆشی یا بەربەلاڤه و چێدبیت ببته ئەگەریێ گەلەك تەنگاڤییێن مەزن و تێکچوونا دەمارا و ئەفجا پێدڤیەكا روون و ئاشكەرا هەیه بو نیاسینا هۆکارێن مەترسیا پەیدا دبیت، دا ب رەنگەکیێ باشـتر تێیگـەهین كا چـەوا دیێ خـو پارێزین و ویێ نەخۆشیێ كونترول كەین. ژبەر ویێ چەندیێ من ئەڤ ڤەكولینه ئامادەكر بـو گـەریان ل هۆكـارێن مەترسیا پەیـدا دبیـت لنـك ئاكنجییێن پارێزگەهـا دهوكیێ.

رێكێن ڤەكولینیێ: پشت بەستن ل سەر هەبوونا گورانكارییێن تیشكی، نموونەیا ڤەكولینیێ هاته دابەشكرن كو (٢٥٨) هەتا (١٢٩) نەخۆشن و (١٢٩) حالەتێن بهێز ژ بنگـەهیێ دهـوك یـیێ نەخۆشـێن روماتیزمیێ ژ ٤/١ هـەتا ٢٠١٤/٩/٣٠. ، ئـەڤ پێزانینـه ژ هـەمی پـشكداران هاتنـه وەرگرتن، تەمەن، رەگەز، بواریێ هەفژینینیێ، كێش، درێژی، جگارەكێشان، روژا نەخۆشیێ، بكارئینانا دەرمانا، هژمارا بالیفكێن نۆستنیێ زێدەباری لبەركرنا شاشكیێ لنك زەلامان. بەرنامیێ (SPSS) هاته بكارئینـان د شـروڤەكرنا ئامارێدا وئاسـتیێ ($\leq$ 0.05) هاتـەوەرگرتن وەك جیاوازیا ئامارییێ یا مەعنەوی هەروەسا هەروەوی رێژەیێن (odds ratio and95% CI) هاته وەرگرتن وەك پیڤەرەك بو مەترسییێ.

ئەنجام: ب رەنگەكیێ گشتگر تەمەن مەزنترین هۆكارێ مەترسیا بهێزبوو لنـك هـەردوو رەگـەزان (55 – 13 OR) سـەبارەت ئافرەتـان هۆكارێن مەترسییێ ب ڤی رەنگینه: بكارئینانا دەرمانان (4.01 OR) تێكرایێ پارستەیا لەشی (3.44 OR). پاشـی كاركرنا گەلـەك روینـشتن (2.64 OR). لێ زەلام ب ڤی رەنگینـه: لبـەركرنا شاشكیێ (16.8 OR) كاركرنا گەلـەك روینـشتن (5.6 OR) پاشـی جگارەكێشان (4.18 OR) چالاكیا لەشی ب تێكرایێ ($\geq$150 min/wk) پەیوەندیەكا بەرەڤاژی دیاركر ب ئاستیێ ئامارا مەعنـەوی (value < 0.05 P) لنك زەلامان (0.34 OR) و ئافرەتان (0.18 OR).

دەرئەنجام: بریرا ستوی یا جیاواز ب نیشانان گرێدایه ب پەیوەندیەكا پوژرەتیڤ دگەل تەمەنی و كاركرنا گەلـەك روینـشتن لنـك هـەردوو رەگەزان، هەروەسا پەیوەندیەكا پوژرەتیڤ هەیه ب ئاستیێ ئامارا مەعنەوی دگەل بكارئینانـا دەرمانـان و تێكرایـیێ پارسـتەیا لەشـی لنـك ئافرەتان ب بەراوردكرن ب لبـەركرنا شاشكیێ و جگارەكێشانیێ لنك زەلامان.

الخلاصة

عوامل الأختطار للفقار العنقي المشخص شعاعيا في دهوك:
دراسة الحالات المراقبة

خلفية واهداف البحث: ان الفقار العنقي هو عنوان عريض يشير الى حالة اضمحلال مزمنة تعزى بشكل عام الى تقدم العمر اضافة الى عوامل اختطار محتملة. ان المرض شائع ويمكن ان يتسبب بمعاناة كبيرة وخلل عصبي وعليه فهناك حاجة واضحة للتعرف على عوامل الاختطار المحتملة. لاجل ذلك اعدت هذه الدراسة لتقصي عوامل الاختطار المحتملة لدى قاطني محافظة دهوك.

الاشخاص والطرق: أجريت الدراسة في مركز دهوك للامراض الروماتزمية للفترة من ٤/١ الى ٢٠١٤/ ٩/٣٠.اعتمادا على وجود التغيرات الشعاعية (علامات الفقار) في اشعة العنق تم اختيار (١٢٩) مريض ومن المراجعين الذين لم توجد عندهم تغيرات شعاعية تم جمع (١٢٩) حالة ضابطة. هذا وقد تم اخذ المعلومات التالية من كل المشاركين: العمر، الجنس، الحالة الزوجية، الوزن، الطول، التدخين، التاريخ المرضي، استعمال الادوية، عدد وسائد النوم اضافة الى ارتداء غطاء الراس التقليدي لدى الرجال. تم استعمال برنامج (SPSS) في التحليل الاحصائي واعتمد المستوى (0.05%) كفارق احصائي معنوي كما اعتمدت نسب الـ(odds ratio and 95% CI) كمقياس للاختطار .

النتائج: كان العمر اكثر عوامل الاختطار قوة لدى الجنسين (OR 13.55). بالنسبة للنساء كانت عوامل الاختطار كالاتي: استعمال الادوية (OR 4.01) معدل كتلة الجسم (OR 3.44) ثم العمل كثير الجلوس (OR 2.64) اما الرجال فكانت كالاتي: ارتداء غطاء الراس التقليدي (OR 16.8) العمل كثير الجلوس (OR 5.6) ثم التدخين (OR 4.18). أظهر النشاط البدني بمعدل (١٥٠% دقيقة أسبوعيا) علاقة عكسية بمستوى احصائي معنوي (P value <0.05) لدى كل من الرجال (OR 0.34) والنساء (OR 0.18).

الاستنتاجات: ان الفقار العنقي المتسم بالاعراض يرتبط بعلاقة ايجابية مع العمر والعمل كثير الجلوس لدى كلا الجنسين كما ان هناك علاقة ايجابية بمستوى احصائي معنوي مع استعمال الادوية ومعدل كتلة الجسم لدى النساء مقارنة بارتداء غطاء الراس التقليدي والتدخين لدى الرجال