Evaluation of Prevalence of Low Back Pain Among Residents of Tabriz University of Medical Sciences in Relation with Their Position in Work

Tebriz Üniversitesi Tıp Bilimlerinde Görevli Asistan Doktorlar Arasında İş Yeri Pozisyonlarına Bağlı Olarak Yaygın Görülen Bel Ağrısının Değerlendirilmesi

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SUMMARY

Objectives

Lower back pain is one of the most common complaints among the general population and among health professionals. Multiple workplace-related risk factors may contribute to back pain among physicians. The aim of this study was to assess the prevalence of lower back pain among medical residents of different medical specialties and to evaluate the relevant risk factors.

Methods

A Dutch Musculoskeletal Questionnaire (DMQ) was completed by 125 medical residents. Part I concerned general demographic information, part II evaluated workplace-specific factors, and part III assessed the individual characteristics of lower back pain.

Results

The overall prevalence of lower back pain among residents was 56.8%, with 45.1% of men and 76.5% of women reporting lower back pain. A total of 94.4% of affected individuals believed that their lower back pain was related to their current job, and 72.6% claimed that the onset of lower back pain occurred after beginning medical work. Statistical analysis revealed a significant correlation between lower back pain and certain risk factors, such as working in the same position for long periods, repetitive movement (bending, twisting) of the lumbar region, working in uncomfortable postures, stress, walking, and standing for long periods. However, no significant relationship was found between lower back pain and heavy lifting, smoking, or prolonged sitting. The role of exercise as a protective factor in reducing the incidence of lower back pain was supported by the statistical analysis.

Conclusions

The prevalence of lower back pain among residents is high and is associated with a number of workplace-related risk factors.

Key words: Low back pain; resident; position.

ÖZET

Amaç

Genel popülasyon ve sağlık çalışanları arasında bel ağrısı en yaygın şikayetlerden biridir. İş yerindeki çeşitli risk faktörleri doktorlar arasında görülen bel ağrısına sebep olabilir. Bu çalışmanın amacı, farklı tıbbi uzmanlık alanlarında görevli asistan doktorlar arasında bel ağrısı şikâyet sıklığını ve ilgili risk faktörlerini değerlendirmekti.

Gereç ve Yöntem

Alman Kas-İskelet Sistemi Rahatsızlık Anketi 125 asistan doktor tarafından doldurduldu. Anketin 1. bölümü genel demografik bilgiler ile ilgili olup 2. bölüm iş yerine özel risk faktörlerini, 3. bölüm ise bel ağrısının özel niteliklerini değerlendiriyordu.

Bulgular

Asistan doktorlar arasında görülen bel ağrısının genel sıklık derecesi %56,8'ken bel ağrısından şikâyetçi olan kadınlar %76,5'lik ve erkekler %45,1'lik bir dilimi oluşturdu. Bel ağrısı şikâyeti olan bireylerin %94,4'ü, bel ağrılarının mevcut işleri dolayısıyla ortaya çıktığına inanırken %72,6'sı bel ağrısının sağlık sektöründe çalışmaya başladıktan sonra başladığını iddia etti. İstatiksel analiz, uzun süre aynı pozisyonda çalışmak, bel bölgesinin yinelenen hareketleri (eğilme, bükülme), rahatsızlık verici postür ile çalışmak, stres, yürümek ve uzun süre ayakta kalmak gibi çeşitli risk faktörleri ile bel ağrısı arasında bir bağlantı olduğunu ortaya koydu. Ancak, ağır kaldırmak, sigara içmek ve uzun süre oturmak ile bel ağrısı arasında önemli bir ilişki saptanmadı. Bel ağrısı şikâyetini azaltmak için uygulanan belirli egzersizlerin koruyucu özelliği bu istatiksel analizle de desteklenmiştir.

Sonuç

Asistan doktorlar arasında bel ağrısı şikâyeti yüksek olmakla birlikte iş yerine özel birçok risk faktörüyle de bağlantılıdır.

Anahtar sözcükler: *Bel ağrısı; ikamet; pozisyon.*

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Introduction

Lower back pain is one of the most common complaints among the general population[1] as well as among healthcare professionals. In the general population, point prevalence of 12-33%, annual incidence of 22-65%, and lifetime prevalence of 11-48% have been reported.[2] The annual prevalence of lower back pain among healthcare professionals is approximately 77%.[3]

The working conditions for physicians have been considered as a major risk for the development of musculoskeletal disorders (MSD).[4] Important risk factors for MSD include prolonged standing and sitting, poor posture, heavy lifting, pushing or pulling of objects, bending and twisting, or heavy physical work. Nevertheless, these factors differ according to each physician specialty.

Unfortunately, most epidemiological studies on this topic have been conducted in developed countries and do not necessarily reflect the specific risks associated with healthcare work. The occupational hazards associated with lower back pain have not been examined thoroughly within the medical community, particularly in developing regions.

The aim of this study was to investigate the prevalence of lower back pain and the associated risk factor among residents within the emergency medicine, surgery, internal medicine, radiology, dermatology and neurosurgery departments relative to the general population.

Materials and Methods

This cross-sectional study included 125 residents (emergency medicine, surgery, internal medicine, radiology, dermatology, and neurosurgery) out of the total population of 194 residents at the Imam Reza Hospital of Tabriz University of Medical Sciences in the northwest health center of Iran. The study was approved by the Ethics Committee of the Tabriz University of Medical Sciences, Tabriz, Iran. All subjects participated voluntarily and the exclusion criteria consisted of trauma to the lumbar area or vertebral fractures. Finally, senior residents of all specialties were excluded due to a study break coinciding with the period in which the questionnaire was distributed.

In order to standardize the study methods, the Dutch Musculoskeletal Questionnaire (DMQ) was translated into Persian. After the verification of the translation by the Research Committee Experts of Tabriz University of Medical Sciences, the DMQ was distributed to residents. Because of the comprehensive nature of the questionnaire, only the part of the questionnaire specifically relating to the study topic of our study was selected and modified. The resulting questionnaire was composed of three parts. The first part concerned demographics (28 questions about age, sex, weight, height, etc.). Part II concerned workplace-specific factors (eight questions) while part III consisted of questions assessed the characteristics of the subject's lower back pain (11 questions). Instructions on completion of the questionnaire and the purpose of the study were provided to the participants.

Following completion of the questionnaires the data were divided into two categories. The term positive group was used for subjects who had experienced lower back pain during the past 12 months, whereas subjects who did not have lower back pain during the past 12 months were designated as the negative group. Univariate analysis with the t-test and chi-square test (SPSS 14 software) were used for comparing occupational risk factors between the positive and negative groups. The overall prevalence of lower back pain and prevalence among each specialty field was calculated. A P-value less than 0.05 was considered statistically significant.

Results

In this study, 150 medical residents (emergency medicine, surgery, internal medicine, dermatology, radiology and neurosurgery) from Tabriz University of Medical Sciences, Tabriz, Iran, completed a questionnaire regarding lower back pain between 1 June 2013 and 31 August 2013. A total of 25 cases were excluded from the initial sample for the following reasons: 23 were senior residents, one had a history of major trauma to the lumbar area, and one had a history of vertebral fracture. Of the 125 participants included in the final study population, 73 (58.4%) were male while 52 (41.6 %) were female.

The prevalence of lower back pain during the previous 12 months was 56.8% among all residents (prevalence of lower back pain according to specialty is summarized in Table 1). Among residents, 48.1% of the emergency medicine residents, 75% of the dermatology residents, 90.9% of the internal medicine residents, 100% of the surgery residents, and 80% of the neurosurgery residents believed that lower back pain was attributable to their current work.

Gender was a significant risk factor for lower back pain, with 76.9% of women and 45.2% of men reporting lower back pain in the previous year (p=0.004). The mean age among individuals reporting lower back pain was 33.44 years, while the negative group had a mean age of 33.81 years. The mean BMI (body mass index) among individuals with lower back pain was 24.61 compared to 24.87 among individuals who did not report lower back pain (Table 3).

No significant relationship was found between incidence of lower back pain and heavy lifting (p=0.54), smoking

Table 1. Prevalence of low back pain among specialties

Specialty (n)	Emergency medicine (n=31)	Radiology (n=23)	Internal medicine (n=38)	General Surgery (n=38)	Dermatology (n=9)	Neurosurgery (n=8)
Prevalence (%)	83.9	43.5	57.9	43.7	33.3	37.5

Table 2. Calculated significances of risk factors among residents of different specialities

Specialty / Risk factor	Surgery (p-value)	Radiology (p-value)	Neurosurgery (p-value)	Dermatology (p-value)	Internal (p-value)	Emergency medicine (p-value)	Total medicine (p-value)
Working in the same position for long periods	*	0.012	*	0.974	0.464	0.113	0.043
Repetitive movement (bending, twisting) of lumbar region	0.362	0.370	0.408	0.453	0.031	0.746	0.030
Working in uncomfortable posture	*	0.008	0.028	0.018	0.080	0.424	≤0.0001
Stress	0.086	0.092	*	*	0.023	0.038	≤0.0001
Standing for long periods	*	0.005	*	0.343	*	*	≤0.0001
Walking for long periods	*	*	0.168	*	*	0.521	0.016
Movement of heavy loads	0.362	0.002	*	*	0.215	0.371	0.054
Smoking	0.881	0.265	0.766	0.942	0.652	0.591	0.372
Prolonged sitting	0.949	*	*	*	0.503	0.429	0.245

*Relations could not be compared due to similarity of data.

Table 3. Distribution analysis of individual factors

		Total (n=125)	With low back pain (n=71)	Without low back pain (n=54)	p
Age	Mean (SD)	33.6 (4.81)	33.33 (5.27)	33.81 (4.16)	0.6
Sex	Female, n (%)	52 (41.6)	40 (76.9)	12 (23.07)	0.004
	Male, n (%)	73 (58.4)	33 (45.2)	40 (54.7)	
BMI	Mean (SD)	24.72 (2.67)	24.61 (2.5)	24.87 (2.7)	0.5

(p=0.372), or prolonged sitting (p=0.245).

There was a statistically significant correlation between lower back pain and workplace risk factors including holding the same position for long periods (p=0.043), repetitive movement (bending, twisting) involving the lumbar region (p=0.03), working in uncomfortable postures (p≤0.0001), stress (p≤0.0001), walking (p<0.01), prolonged standing (p≤0.0001) and exercise (p=0.021).There was a significant relationship between exercise and the frequency of lower back pain (p= 0.021). The results of the statistical analysis are presented in Table 2.

Discussion

Among participants in the present study, 56.8%had experienced lower back pain within the previous 12 months. These data are consistent with a systematic review by Aireksinen et al., in which the prevalence of lower back pain in the general population was estimated at 22- 65%.[2]

The present study results are also consistent with a report by Omokhodion et al., which examined the prevalence of lower back pain among workers at a hospital in Nigeria. In that study, 46% of healthcare workers, including 69% of nurses,

reported lower back pain.[5] In a Malaysian study performed by Wong et al., the prevalence of lower back pain was 56.9% among hospital staff.[6] Mehrdad et al. conducted a study of lower back pain among general practitioners and specialists in a hospital in Tehran, Iran, and reported an overall prevalence of 15.1%.[4] This lower prevalence may be due to the greater workload places on medical residents relative to other doctors.

Two studies, one by Walsh et al. in Britain and another by Rotgoltz et al., in Israel, showed no difference in the prevalence of lower back pain between males and females.[7,8] However, the systematic review by Omokhodian et al. in Australia revealed an increased prevalence of lower back pain among women relative to men,[5] similar to the present study.

In 2010, a Malaysian orthopedics journal published a study by Wong et al. regarding the prevalence of lower back pain and associated risk factors among hospital staff. In that study, 84.1% of individuals who reported lower back pain believed that their pain was related to their current job.[6] The results of this research were similar to our results, in which 94.4% participants believed that their pain was related to their current job and 72.6% believed that their pain began during their current job.

A study performed by Frank et al. in 1993 reported a strong correlation between smoking and lower back pain.[9] This result contrasts with the present study as well as the report by Wong et al.[6] In the present report, the relatively low number of smokers among participants (11% of the total study group) May account for the difference between the various reports.

Concerning the role of exercise as a risk factor for lower back pain, the available studies have yielded a variety of results. For example, in the study conducted by Wong et al. there was no relationship between exercise and lower back pain. [6] The study by Demblans-Dechans et al. suggested that exercise was associated with more severe lower back pain,[10] while a study by Henchoz et al. demonstrated that exercise had a protective role in lower back pain.[11] The results of the present study are consistent with the report by Henchoz et al.. The apparent discrepancies in the published literature may be attributable to variation in exercise type and intensity.

Psychological stress can influence the development and severity of multiple disorders. Systematic reviews by Hoogendoorn et al.[12] and Linton et al.,[13] have supported the important role of stress as a risk factor for lower back pain and the present study is in agreement with these data.

Barrero et al.,[14] and Smedley et al.[15] raised questions regarding the relationship between heavy lifting and the development of lower back pain. However, the present study did not reveal evidence of any association between lower back pain heavy lifting. The subjects participating in the study reported relatively infrequent heavy lifting during normal working conditions. Studies by Mehrdad et al.[4] and Wong et al.[6] have reported an association between prolonged standing and lower back pain, an association that was also demonstrated in the present study. The present study also revealed a significant correlation between repetitive bending and twisting with lower back pain, as had been previously suggested in studies by Kwon et al.[16] and the study of Wong et al.[6] Prolonged standing was a risk factor for the development of lower back pain among radiology residents in the present study. While relative to other specialties, some radiologists spend a larger portion of time in a seated position, long periods standing next to the attending radiologist during training may contribute to lower back pain among residents. The low sample size may also introduce bias in the evaluation of lower back pain among radiologists.

The present study provides evidence of several important occupational risk factors for the development of lower back pain in medical professionals. However, when specialties were evaluated individually, not all specialties were affected by the same occupational risk factors. Sub-division of the dataset according to specialty results in a loss of statistical power and may account for this apparent discrepancy. In addition, not all workplaces involve the same exposure to occupational hazards. For example, in emergency medicine prolonged standing is widely prevalent due to the nature of the work and therefore does not correlated with the presence or absence of lower back pain.

Mean BMI was normal in both positive and negative subjects included in this study and could not be adequately evaluated as a risk factor for the development of lower back pain.

Limitations

Several limitations apply to the interpretation of the study results. Sub-division of the dataset according to medical specialty reduced statistical power for the identification of risk factors for lower back pain. Consequently, a larger sample size would facilitate a more statistically robust analysis of lower back pain risk factors within medical specialties.

Finally, due to the self-report design of the study, recall bias is likely to be a significant factor.

Conclusion

Lower back pain is prevalent among medical residents, with an overall incidence that is comparable to the general population. Further studies are required to develop an effective

preventive method for this relatively common problem.

Conflict of Interest

The authors declare that there is no potential conflicts of interest.

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