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INCIDENCE OF RADIOGRAPHICALLY-DETECTED LUMBAR REGION ANOMALIES IN A YOUNG MALE POPULATION

ERKEK POPÜLASYONUNDA RADYOGRAFİK SAPTANAN LOMBER BÖLGE ANOMALİSİ SIKLIĞI

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SUMMARY:

Spina bifida occulta (SBO), transitional vertebral anomalies such as lumbarization and sacralization, and scoliosis, are structural and functional anomalies that can be detected during radiological evaluation of the lumbar region. The purpose of this study is to evaluate the incidence of lumbosacral deformities in a young male Turkish population.

5000 young male candidates between 18– 22 years old were included in this study during their medical screening in Etimesgut Military Hospital, during November 2008–October 2009. Lumbosacral vertebral X-rays that were ordered in the routine medical screening were evaluated. The X-rays were examined for common congenital lumbosacral anomalies (CLA), such as spina bifida occulta, transitional vertebrae (lumbarization, sacralization), and scoliosis.

Congenital lumbosacral anomalies were detected in 952 (19%) of the 5000 candidates. Of those candidates, 510 (10.2%) had SBO, of which 74 (1.5%) had L5-originating SBO and 436 (8.7%) had S1-originating SBO. Sacralization was observed in 222 (4.4%) candidates, and lumbarization was found in 59 (1.2%) candidates. In 128 (2.5%) candidates, lumbar and/or lumbar-elongated scoliosis was detected. Combined anomalies were detected in 33 (0.7%) candidates.

Our data show similarity with the current literature on congenital lumbosacral anomalies. Although our study was limited to a young male population, our data will be a useful guide for further studies on lumbosacral region anomalies.

Key words: Spina bifida occulta, transitional vertebrae, scoliosis, incidence

Level of evidence: Retrospective clinical study, Level III

ÖZET:

Lomber bölgenin radyolojik tetkiki sırasında spina bifida occulta (SBO), sakralizasyon- lumbalizasyon şeklinde geçiş vertebraları ve skolyoz zaman zaman karşımıza çıkan yapısal ve fonksiyonel anomalilerdir. Bu çalışmanın amacı radyolojik incelemeyle Türk toplumu genç nüfusunda lumbosakral deformitelerin sıklığının araştırılmasıdır.

Kasım 2008- Ekim 2009 tarihleri arasında Etimesgut Askeri Hastanesine sağlık raporu almak için başvuran 18-22 yaş arası 5000 genç erkek çalışmaya alındı. Kontrol sırasında rutin çekilmiş standart ön-arka lumbosakral grafiler incelendi. Grafiler sık görülen konjenital lumbosakral anomaliler (KLA) olan Spina bifida okulta, Sakralizasyon-Lumbalizasyon şeklinde geçiş vertebraları ve skolyoz açısından değerlendirildi.

5000 adayın 952 (% 19) tanesinde konjenital lumbosakral anomali saptandı. Bu adayların 510 (% 10.2) tanesinde SBO saptandı. Bu adayların 74 (% 1.5) tanesinde L5 kaynaklı ve 436 (% 8.7) tanesinde S1 kaynaklı olduğu gözlendi. 222 (% 4.4) adayda sakralizasyon ve 59 (% 1.2) adayda lumbalizasyon bulundu. 128 (% 2.5) hastada lomber ve/veya lomber uzanımlı skolyoz saptandı. 33 (% 0.7) adayda ise kombine anomali mevcut idi.

Elde edilen verilerin lumbosakral anomali sıklığı açısından mevcut literatür bulgularıyla uyumlu olduğu gözlendi. Çalışma sırasında genç erkek popülasyonu esas alınsa da elde ettiğimiz verilerin lumbosakral bölge anomalileri konusunda yapılacak daha farklı çalışmalar için yararlı olacağına inanıyoruz.

Anahtar sözcükler: Spina bifida okülta, sakralizasyon, lumbalizasyon, skolyoz, sıklık

Kanıt Düzeyi: Retrospektif klinik çalışma, Düzey III

INTRODUCTION:

Radiological evaluation of the lumbosacral region is among the evaluations which are carried out as part of a routine health status examination, as part of processes such as assessing an athlete's health or a job application. In lumbosacral X-rays routinely taken in a health status examination, congenital lumbosacral anomalies are commonly encountered, such as spina bifida occulta (SBO), transition vertebrae (TV), and lumbar and/or lumbar-elongated scoliosis.

SBO is caused by fusion failure of the posterior vertebral elements. Generally, it is observed at the fifth lumbar vertebra and/or the upper or lower first sacral vertebra. The incidence in the population varies between 0.6% and 25%[9,15,17.]

In TV, the transverse process of the fifth lumbar vertebra fuses to the first sacral segment at one side or both (sacralization), or the first sacral segment has an abnormal transverse process similar to a lumbar vertebra (lumbarization). The incidence in the population is between 4% and 24%[2,13]. Although these two anomalies are often asymptomatic, it has been reported that they can be responsible for lower back pain and nerve root symptoms as a result of clinical history and examination[12,16,17].

Scoliosis is defined as a vertebral column curve in the frontal plane that exceeds 10° on measurement with the Cobb method in an anteroposterior X-ray. The incidence of scoliosis in Turkey has been reported as 1–10%.

Young male patients were included in this study as they were receiving medical screening at a military hospital. The presence of congenital lumbosacral anomalies was investigated in the candidates, using routinely-taken lumbar X-rays. Thus, it was aimed to determine the prevalence of lumbosacral junction anomalies in a young population of military age.

PATIENTS AND METHOD:

5000 young male soldier candidates, between 18–22 years old, were included in this study during their medical screening in Etimesgut Military Hospital, from November 2008–October 2009.

Lumbosacral vertebral X rays, which were ordered in the routine medical screening, were evaluated. In all X-rays, lumbar-type vertebrae number and morphology, SBO, lumbar and/or lumbar-elongated scoliosis, and transition vertebrae (sacralization and lumbarization) were investigated.

After radiological examination, the presence of spina bifida occulta (SBO), transition vertebrae (TV), lumbar and/or lumbar-elongated scoliosis (LS) or combined anomalies in the candidates was recorded. SBO patients were evaluated on the basis of S1 and L5 originations, and TV patients were evaluated separately on the basis of sacralization and lumbarization.

Table-1. Distribution of the data obtained from the patients (SX: sacralization, LX: lumbarization).

SCOLIOSIS		TRANSITION VERTEBRAE		SBO		COMBINED	TOTAL
		SX	LX	L5	S1		
Number	128	222	59	74	436	33	952
Age	19.3	19.3	2.1	19.3	18.9	19.2	19.4
%	2.5	4.4	1.2	1.5	8.7	0.7	19

Figure-1. Lumbar AP X-ray of a candidate aged 19 with a combined anomaly (scoliosis and sacralization).

RESULTS:

A total of 5000 young male candidates with an average age of 19.1 (range: 18–22) years were included in the study. Congenital lumbosacral anomalies were detected in 952 (19%) candidates (Table-1). Of those candidates, 510 (10.2%) had SBO, 281 (5.6%) had TV, and 128 (2.5%) had lumbar and/or lumbar-elongated scoliosis. In 33 (0.7%) candidates, combined anomalies were present (Figure-1).

Among the candidates with SBO, 74 (1.5%) had L5-originated SBO and 436 (8.7%) had S1-originated SBO.

In TV patients, 222 (4.4%) had sacralization and 59 (1.2%) had lumbarization anomalies.

DISCUSSION:

Many developmental anomalies can be detected in X-rays of the lumbosacral region, and it is accepted that these anomalies can partially cause symptoms. The presence of more than one anomaly detected in lumbar radiological examinations, which are routinely carried out as part of job applications in some industrialized countries, can be a reason for not being accepted for a job. Previously published studies, some evaluating symptomatic and asymptomatic groups, have attempted to determine whether there are any significant differences between anomaly incidences.

In lumbosacral bilateral radiographies taken due to medical reports for various reasons, some developmental lumbosacral anomalies are often encountered[3,5,10]. Although some authors

have suggested that these anomalies do not have clinical importance and are accidentally detected, there are many studies showing that they cause prolonged lower back pain (LBP) or lumbar disc herniation[1,4,12,16,17,18]. The results of these studies are generally controversial, and the reasons for the clinical symptoms are not clear.

Young males were included in this study because the applicants to military service were composed of male candidates aged between 18 and 22, and therefore the findings of the study were evaluated between homogenous groups.

The incidence of SBO has been found in various ratios in previous studies, and has been generally reported between 0.6% and 30%[14,15,17]. In a study conducted on a normal population by Okçu et al. and published in the national literature, the incidence of SBO was found to be 15.8%[11]. The same authors stated that SBO lesions often had no clinical significance, and could be related to intraspinal lipomas, tethered cord syndrome, genitourinary dysfunctions, increase in disc pathologies, lumbar spondylolysis, foot deformities, and syringomyelia. In a study performed using direct abdominal X-rays taken before intravenous pyelography by Güven et al.[8], the SBO ratio was detected as 4%. In a study conducted on young males, Eren et al. reported an SBO ratio of 14% [6]. In our study, the SBO incidence was 10.2%, which is consistent with the literature.

In previous studies, the incidence of transition vertebrae has been reported as 4–24% [2,13].

Zehweiler and Daffner 19 evaluated radiological examinations of 500 cases aged between 20 and 90 in order to test the effectiveness and necessity of lumbar oblique radiographs. In this study, the SBO incidence was found to be 4%. They reported that 13% of the cases had scoliosis and 5% had transition vertebrae at the lumbosacral junction. Although only males within a certain age range were included in our study, the TV incidence was found to be 5.6%, and this was accepted as being consistent with the literature.

In a study including 292 cases, Frymayer et al.[7] detected the rate of scoliosis as 39%, which is high, but they accepted 5° or more of curvature as scoliosis. Güven et al.[8] did not specify a degree for scoliosis in their study that included 1000 cases, and they obtained a ratio of 10.7% by accepting curves of all degrees as scoliosis. Eren et al.6 reported the scoliosis ratio as 3.3% in their study including 1500 cases, and they accepted curves of more than 10° as scoliosis. In studies that defined scoliosis as curvature of more than 10°, ratios between 1% and 10% have been reported. In our study, we accepted curves with 10° or more as scoliosis, and we encountered scoliosis in 2.5% of the cases, which is consistent with the literature.

The most important shortcoming of our study is that it contains only men in the same age group. However, previously published prevalence studies have also screened similar populations, and so our data are thought to be valuable.

In conclusion, spina bifida occulta was detected in one in every ten people, and transition vertebrae in about one in every twenty people, among young males at the age of military service. It has been suggested that this prevalence is remarkable, and it should be kept in mind that lumbosacral junction anomalies can also occur in asymptomatic cases.

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