PREVALENCE AND DISTRIBUTION OF THE INTERVERTEBRAL DISC HERNIATION IN SUDANESE

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ABSTRACT
This study aimed to show data and evaluate the distribution of the intervertebral disc herniation by level, degree of herniation’s, age and gender in Sudanese patients using Magnetic Resonance Images (MRI). This is observational Descriptive Cross-sectional Multicenter hospital based study, conducted in the period between July to September 2015. 100 MRI images (61 males and 39 females) , which were diagnosed with intervertebral disc herniation’s and available at time of the study and fulfilling the inclusion criteria were used and examined for the prevalence, and distribution of the intervertebral disc herniation’s. The results show that the level of the L5/S1 was the commonest site for disc herniation’s (46.3%), followed by L4/L5 (34.8%). Cervical region disc prolapse constitute 1.3% at the region of C4/C5 and 3.5% between C5/C6 respectively. However, studying of the degree and site of the prolapse intervertebral disk (PID) revealed that 66.3% of the patients suffering from major type of disc and 33.7% of the patients complaining of minor degree of intervertebral disc prolapse. Of the prolapsed intervertebral disc (52.6 %) of the cases herniated central in the spinal canal and (47.4 %) were herniate laterally. The males representing high prevalence of (PID) (61.2) compared with females (38.8). Conclusion: This is the first study focusing and reporting the prevalence, distribution, types, and degree of intervertebral disc prolapse in Sudanese. It will improve the knowledge on prevalence of intervertebral disc, and it will provide data that could help in diagnosis and management of prolapse intervertebral disc.

KEYWORDS: Prevalence, Intervertebral disc, Herniation.

INTRODUCTION
The vertebral column consists of 33 vertebrae, there are 7 cervical, 12 thoracic, 5 lumber, 5 sacral and 4 coccygeal vertebrae. Between the bodies of the vertebrae there are fibro cartilaginous discs, the intervertebral disc consists of Annulus fibrous peripherally (compose of concentric lamellae of fibrocartilage), and Nucleus pulposus (compose of ovoid mass of gelatinous material containing large amount of water).[1]

The intervertebral disc are largest in the lumbar and lumbosacral regions, where the movement are greatest, also the intervertebral discs are large in the cervical region.[3] There is no disc found between C1 and C2 vertebrae and also between the sacral and coccygeal vertebrae. The IV discs are form about one- fourth of the length of the vertebral column.[3] and it is supported by anterior and posterior ligaments; the anterior longitudinal ligament is strong fibrous band covers and connects the anterio lateral aspects of the vertebral bodies and intervertebral discs, it extends from the sacrum to anterior tubercle of C1, the value of this ligament are maintains stability of the joints and prevents hyperextension of vertebral column.[4] The posterior longitudinal ligament is weaker than the anterior longitudinal ligament; the posterior longitudinal ligament runs with in the vertebral canal along the posterior aspect of the vertebral bodies, it attached to the posterior aspect of the intervertebral disc and vertebral bodies from C2 to sacrum. The value of the posterior longitudinal ligament helps and prevents hyper flexion of the vertebral column and posterior herniation of the intervertebral disc. The functions of IV disc are acts as shock absorber and prevent friction between the vertebral bodies.[3] The disc prolapse is a herniation of the nucleus pulpos through annuls fibrous, there are many types of disc herniation’s cervical, lumbar, and Lumbosacral. The signs and symptoms of disc prolapse are: back pain, neck pain in case of cervical, weakness, numbness, tingling, and myelopathy.[5]

In the upper disc herniation at L1- L2, L2- L3 and L3-L4 levels have been reported to constitute no more than 5% of all disc Herniation.[5] The herniation occurred at
L4 – L5, L5- S1 about 76% of all disc herniation and its commonly more prevalence in male than female.\(^6\) A sedentary lifestyle, frequent driving, chronic cough, pregnancy, smoking, and frequent lifting of heavy objects are considered risk factors.\(^7,8\)

This study aimed to show data about the prevalence and distribution of the intervertebral disc prolapse among the Sudanese patients using The MRI images.

**MATERIAL AND METHODS**

This is Observational Descriptive Cross-sectional Study Multicenter Hospital Based Study conducted at Khartoum hospitals, in the period between July To September 2015 including the patients presented to hospitals in radiological department prepared to Magnetic Resonance Images (MRI) imaging for vertebral column, a patient records were also considered. The patients with vertebral column deformity or trauma were excluded from this study. The magnetic resonance imaging [MRI] of vertebral column in 100 adult patients (61 males and 39 females ) diagnosed with intervertebral disc herniation, were randomly selected and used to study the prevalence of intervertebral herniation, incidences of disc herniation among gender, the vertebral level of disc herniation, and the degree of disc herniation. The data analyzed using SPSS (T.test. ANOVA) computerized program. The results consider significant at P. 0.05.

**RESULTS**

The MRI images from the patients diagnosed with disc prolapse were examine for location, and degree of the prolapsed disks. The results show that the locations L5/S1 was the commonest site for disc herniation’s (46.3%), followed by L4/L5 (34.8%). Cervical region disc prolapse constitute 1.3% at the region of C4/C5 and 3.5% between C5/C6 respectively. Only one in the thoracic region the occurrence of intervertebral disc prolapse was 3.8 at the level between T6/T7. Fig (1). There was no patients with multiple prolapsed disks demonstrated in this study.

To study the degree and stages of the prolapse intervertebral disk (PID), the degree of the disc herniation in the spinal canal at the MRI images was examined, our results revealed that 66.3% of the patients suffering from major type of disc herniation correlated with severe neurological symptoms include, pain and muscular weakness. While 33.7 % of the patients complaining of minor degree of intervertebral disc prolapse (Fig 2).

**Fig (1): Shows the prevalence of intervertebral disc at different level of vertebral column.**

To investigate the direction of the prolapsed intervertebral disc, the direction and location of the prolapsed disc in the spinal canal was examine, our results show that the prevalence of central disc herniation was 52.6% while the lateral disc herniation was 47.4% (Fig 3).

**Fig (2): Shows the prevalence of the direction of intervertebral disc herniation.**

The site and direction of the prolapse disc explain the differences in neurological symptoms that result of compression of structures inside the spinal canal including the spinal cord and the spinal nerves.

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**Fig (3): Shows the prevalence of the degree of intervertebral disc herniation.**

To investigate the gender variations in the prevalence of the intervertebral disc, the distribution of the disc...
herniation studied among males and females patients. Our results show that, the intervertebral disc was commonest in the males (61.2%), while in females was (38.8%) Fig (4).

Fig (4): Shows the gender prevalence and distribution of the intervertebral disc herniation.

DISSECTION

Low back pain (LBP) has been reported is common already among children and the prevalence increases with age.[9] lifetime prevalence being up to 50% of 20-year-old men.[10] The etiology of LBP in adolescence remains largely unknown. Some authors claim that adolescent LBP is primarily related to psychosocial factors. Various studies have shown that the lifetime prevalence of a major episode of low back pain ranges from 60% to 82%, but only 10% of these episodes are accompanied by sciatica.[11] The signs and symptoms of disc prolapse are include, back pain, neck pain in case of cervical, weakness, numbness, tingling, and myelopathy.[12] Knowledge of the distribution and risk factors of intervertebral disc herniation’s is important in controlling of the risk factors, diagnosis, and managements.

This study aimed at describing the distribution of (PID) by site, stage, gender and risk factors in Sudanese patients using MRI. These results are concordant with reports that most of the disk prolapse cases occur in the lumbar region followed by the cervical, this study noted that the level of L5/S1 followed by L4/5 is commonest sites of intervertebral disc herniation’s this in consistent with the previous studies that reported locations L4/5 was the commonest (42.3%), followed by L5/S1 (25.5%).[13] The high incidences of the lumbar spine and especially L4 – 5; L5 – S1 to disc prolapse is related to the increased weight it has to bear due to upright posture, lumbar lordosis and wider range of movement it allows. Generally, it reported that prolapse intervertebral disc is commoner in males than in females.[14,15] Observations of the present study reveal that in Sudan, prolapse vertebral disc is commoner in male than in females. Previous studies have revealed varying male: female ratios.[17] Suggesting that variations in genetic or environmental factors influence the gender distribution. The most frequent environmental factors include type of work and position of the body assumed at work.[18,19] Our results revealed that the prevalence of direction and the stages of the prolapse vertebral disc is important in explanation of the signs and symptoms, which include prolong pain and muscular weakness. Moreover, it is useful in guiding of the management and treatments line. It agreed that lumbar disc herniation has a favorable natural history, the clinical course of the disease without therapeutic intervention. Some of the patients treated with only bed rest and a corset for several time, markedly assist in reduction in pain and improvement in function over time.[20,21] Our results it is the first studying the prevalence of degree and stages of the prolapse intervertebral disc and concluded that this study induce an impact on knowledge about the prevalence of the intervertebral disc prolapse.

REFERENCES