

## MRI Findings in Cervical Spine in Sudanese Patients with Neck Pain

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### **Abstract:**

**Objective:** The goal of this study was to find out the common MRI finding for cervical spine in Sudanese patients with neck pain and its relations with age and gender and determine the most affected disc level.

**Materials and Methods:** Data were collected from 53 patients from both genders their ages between 20 to 80 years old came to radiological departments of Aliaa Specialist Hospital, Alribat University Hospital, and Antalya Centre for cervical MRI scan in a period from July 2020 to September 2020. The data were collected from medical reports using data collecting sheet. The data analyzed by SPSS (version 19).

**Results:** The study found that the most common MRI findings were disc bulge (52.6%), disc degenerative changes (22.7%), and spondylosis (11.3%), while the most common affected disc level were C4/C5 (29.9%), C5/C6 (26.8%) and C3/C4 (24.7%).

**Conclusion:** The study showed that the cervical disorder is common in female and in subject over forty but also The study revealed that the MRI findings had no significant different nor with age neither with gender. The study recommended evaluating younger age groups which suffering from neck pain

**Key Word:**Cervical spine; MRI finding, neck pain ,disc bulge

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### **I. Introduction**

Similar to back pain, neck pain has recently shown to have increasing prevalence. In 2017, the prevalence and incidence rate of neck pain were 3551.1 and 806.6 per 100,000, respectively<sup>1</sup>. Cervical spine is particularly more prone for degenerative change due to the excessive mobility of the region to aid in neck movement. Since it's the most spinal mobility with as much as 600 movements per hour in a normal individual, add to that its peculiar position, functions and its intervertebral discs in the human body make it prone to degenerative changes and other functional disorders. Many influential factors such as age, sex, occupation and weight also lead to the degenerative changes<sup>2, 3</sup>. Among many examinations, magnetic resonance imaging (MRI) is more accurate than simple radiography, myelography, discography, and computed tomography (CT)<sup>4</sup>. In addition it is a noninvasive imaging technique that is usually used to investigate the potential causes of neck pain. Differences in MRI findings among people are expected to be associated with age, gender, and quality of life<sup>5</sup>.

In previous similar studies degenerative diseases in the cervical spine are the most common neurological disorders which were predominant in the older age groups<sup>5, 6</sup>. The age-dependence of cervical spine degenerative changes was more notable in females<sup>7</sup>. Disc degeneration is most common in the middle cervical spine (C5/6) and progresses to contiguous levels<sup>8</sup>. There is a wide variability in the reported prevalence of different MRI findings such as for example disc degeneration and Modic changes and only limited knowledge is available to inform the clinician about what should be expected of MRI findings at a certain age and how this relates to neck pain in different populations<sup>9</sup>. For that this study aimed to evaluate the cervical spine changes and disorders in symptomatic Sudanese patients and to correlate these findings with patient's age and gender.

## **II. Material And Methods**

This retrospective cross-sectional study was carried out in three hospitals in Khartoum, Sudan. 53 patients were enrolled in this study (30 female and 23 male), their age ranged between 20 to 80 years. The data were collected from 95 disc levels. The data were taken from the medical reports, which were written by qualified specialists. The data was collected using data collecting sheet which was designed to comply with this study. The Collected variables included: age, gender, the affected disc levels, and the MRI findings. Ethical approval was obtained from the Ethical Committee board of the Private Medical Centers. The MRI examinations were carried out using open MRI machine (0.35 T) manufactured by Neusoft, and two superconductive machines (1.5 T) manufactured by General electrical (GE) and Toshiba. All patients underwent cervical MRI scan using comparable protocol; sagittal T1 weighted image, sagittal T2 weighted image, sagittal STIR, axial T1, and axial T2\* pulse sequences. All patients used cervical coil. The images were diagnosed by highly experienced radiologists. Data analysis was carried out using SPSS statistical program based on descriptive statistics, comparative, and relationship tests to demonstrate the most common finding and the most common level of pathology and relation of disorders with age and gender. The results were represented as tables and figure.

## **III. Result**

This retrospective cross-sectional study was conducted on (53) subjects; most of them were females 30 (56.6%) while males represent 23 (56.6%). The patient their age ranging between 20 to 80 but the majority (85%) were more than 40 years old whose underwent a cervical MRI scan .The result found that 51 (97.9) of the cases had abnormal finding (table 1).

**Table no 1:** Distribution of the sample according to the gender, age groups and the MRI finding.

Age	Frequency	Percent
<b>Gender</b>		
Male	23	43.4
Female	30	56.6
<b>Age groups</b>		
Less than 30 years	4	7.5
30-40 years	4	7.5
41-50 years	15	28.3
51-60 years	18	34.0
More than 60 years	12	22.6
<b>MRI Finding</b>		
Normal	2	2.1
Abnormal	51	97.9

Table no 2: Of the 51 abnormal cases there were 95 affected disc levels were detected. Some of the cases had one disc and most of them get multiple disc level. The most common MRI findings were disc bulge (54.7%), disc degenerative changes (23.1%), and spondylosis (11.3%) table 2.

**Table no 2 :** The common pathological finding in cervical MRI

Pathology	Frequency	Percent
Disc bulge	52	54.7
Disc protrusion	6	6.3
Degenerative disc disease	22	23.1
Neurofiberoma	1	1.0
Spondylodegenerative disease	2	2.1
Spondylosis	11	11.6
Spondylodiscitis	1	1.0

;In the study 95 disc level were involved and the most common level of pathology was C4/C5 (29.9%), C5/C6 (26.8%), and C3/C4 (24.7%) table 3

**Table no 3:** Frequency of affected disc level with in the sample

Disc level	Frequency	Percent
C2\C3	1	1.0
C3\C4	24	25.3
C4/C5	29	30.5
C5/C6	26	27.4
C6/C7	15	15.8
<b>Total</b>	<b>95</b>	<b>100.0</b>

#### IV. Discussion

A cervical spine MRI is usually used to diagnose the cause of neck pain .There is wide rang of MRI finding can be detected. Which influence by many factors such as age, sex, occupation and weight. This study found that females is more prominence than male this is match with the previous studies <sup>10</sup>.The suspected explanations including hormonal differences and the belief that men may be less willing to report pain so detect pathology.also this study the disc bulge had high incidence and This result was similar to a previous retrospective study of (Karki DB et al., 2016) <sup>11</sup> who finds that disc degeneration and disc budge were the most common findings. The study found that MRI findings do not significantly differ between males and females (P-value > 0.05) which indicates that MRI findings are independent of gender, although the study found that most females developed disc bulges, while the male had disc degenerative changes. This result was in line with other previous studies of (Ali Alghamdi and Abeer Alqahtani., 2021)<sup>5</sup> and (Ali M. Alshami., 2015)<sup>12</sup>. The study found that the MRI findings do not significantly differ between different age groups (P-value > 0.05) which indicates that MRI findings are independent of age which is consistent with the study of (Ali Alghamdi and Abeer Alqahtani., 2021)<sup>12</sup>. Although the study found that the disc bulge was common in middle age while the degenerative disc disease was common in the elderly. This finding explains that disc degenerative diseases are age-related diseases while disc bulge is a simple form of vertebral disease that may arise at any age.

The most affected disc level in this study were C4/C5 and C5/C6 and this finding is in agreement with the result of (Mustafa et al., 2014)<sup>13</sup>, who also found that the most affected level was C4/C5, and cervical spondylosis and degenerative disc disease are common in this locality.

#### V. Conclusion

The study showed that the common MRI findings in Sudanese are the disc bulge and the degenerative disc diseases. The female had more cervical disorder than male. Also the C4\C5 is the most affected disc level in cervical spine. Cervical changes are common over forty. The study reveals that the MRI findings had no significant relation nor with age neither with gender.

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