ORIGINAL ARTICLE

NON-DISCOGENIC SCIATICA MIMICKING DISORDERS: A DILEMMA FOR NEUROSURGEONS IN MAKING SURGICAL DECISIONS

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ABSTRACT

Introduction: The cause of sciatica is not always discogenic and majority of patients are misdiagnosed as having discogenic sciatica while the underlying non discogenic causes are overlooked. This study aimed at evaluating the frequency of non-discogenic sciatica in patients presenting with lumber radiculopathy.

Material & Methods: A prospective case series study was conducted from February 2022 to January 2023 at Ali Institute of Neurosciences, Irfan General Hospital Peshawar. Nonprobability convenience sampling technique was incorporated. A total of 624 patients were reported to the OPD with clinical presentations of sciatica out of which 81 patients were included after thorough subjective, objective, and radiological investigation. Data was analysed using SPSS version 26.

Results: Five hundred forty-three (87%) patients were diagnosed with discogenic sciatica while 81(13%) patients were categorized under non discogenic disorders causing radicular symptoms. Majority of the patients 51(63%) were males as compared to females 30(37%) in the non-discogenic group. Out of 81 cases diagnosed with non-discogenic sciatica,26 cases (32%) were due to spinal tumours, facet dysfunction 10(12%), piriformis syndrome6(7%), cluneal nerve disorder2(2%), quadratus lumborum dysfunction4(5%), osteoarthritis of the hip3(4%), peripheral nerve disorders 8(10%), sacroiliac joint 3(4%) infections 10(13%),trauma to gluteal region 3(4%), pregnancy associated sciatica 2(2%), compressive neuropathy 4(5%).

Conclusion: There are a number of non-discogenic disorders causing symptoms of lumber radiculopathy. Identifying the underlying non discogenic cause is still challenging. Considering the possible pathologies, detailed history taking and objective examination along with diagnostic tests and investigations can lead to the identification of underlying pathologies and their management.

Key Words: lumber radiculopathy, non-discogenic, sciatica

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INTRODUCTION

Sciatica or lumbosacral radiculopathy is a clinical entity characterized by radiating pain below the knee, following a dermatomal pattern or presence of at least one of the neurological finding including abnormal reflex changes, myotomal weakness and sensory disturbance in dermatomal distribution.[1] Ancient Greeks and Egyptians investigated that there exists a relationship between leg and lumber pain. The word Sciatica is derived from 'ischios'

meaning hip in Greek and was first reported to be used by Hippocrates. [2] Annual incidence of sciatica is reported to be 1 to 5 percent peaking in the fourth decade of life. Besides causing significant disability, sciatica imparts a great burden on socio-economic life worldwide. [3]

In almost 90% of all cases presenting with the symptoms of sciatica, the cause is usually attributed to compression of nerve roots due to disc herniation which commonly affects the L4/L5 and L5/S1 levels. However, the cause of sciatica is not always discogenic and majority of patients are misdiagnosed as having discogenic sciatica while the underlying cause is neglected without going for any further investigation.[4] Some etiologies associated with back and leg pain such as arthrogenic, muscular, neurogenic, discogenic and psychogenic are categorized in table 1.[5-8] Along its path from the sacral foramen and going downward, the sciatic nerve may be affected by non-discogenic causes including several intra spinal or extra spinal pathologies such as neoplastic, infective, traumatic, inflammatory, vascular, gyneacological and muscular disorders. Malignant peripheral nerve sheet tumours, neurofibromas and schwanonomas are some of the primary tumours which compresses the sciatic nerve causing symptoms of radiating leg pain.[9] Extra uterine endometriosis is attributed to be the most common gynaecological cause of sciatica according to recent studies in which the symptoms are manifested few days before menstruation, increases gradually and then decreases after the menstruation referred to as cyclic sciatica.[10] There are also some extra spinal disorders mimicking sciatica which needs to be ruled out in the examination. These extra spinal disorders include but are not limited to piriformis syndrome, cluneal nerve disorder, quadratus lumborum myofascial syndrome, walletosis, tumours, post injection sciatica and piriformis pyomyositis.[11] Some medications are also associated with simulating the symptoms of sciatica such as antivirals, statins and anti-fibrillation drugs.[12] False positive MRI findings makes the diagnosis more biased as they can be positive in asymptomatic individuals without any nerve root irritation.[13] Typical examination findings evident in non-disco genic sciatica are: negative straight leg raising test (SLRT), extremely painful infragluteus area between greater trochanter and ischial tuberosity in the area of sciatic nerve along with positive tinel sign. [4] Correlating the findings of investigations with a through subjective and objective examination is the best way to reduce the chances of misdiagnosis and carrying unnecessary surgical procedures.[14] The objective of this study was to find out the frequency of non-discogenic sciatica in patients presenting with symptoms of sciatica attributed to non-discogenic etiology.

MATERIAL AND METHODS

A prospective case series study was conducted from February 2022 to January 2023 at Ali Institute of Neurosciences, Irfan General Hospital Peshawar. Ethical approval was granted from the institutional review committee. Nonprobability convenience sampling technique was incorporated. A total of 624 patients were reported to the OPD with clinical presentations of sciatica out of which those patients were excluded from our study who were diagnosed with disc pathology as the main cause of sciatica. A thorough subjective examination including details about systemic symptoms such as weight loss, fever, history of trauma and generalized symptoms were recorded. Objective examination included straight leg raise test, dermatomal, myotomal and reflex testing, hip and sacroiliac joint examination, testing for muscular causes such as piriformis syndrome, quadratus lumborum, hamstring and dura. Along with objective examination, radiological and laboratory investigations such as plain x ray MRI, CT scan, NCS, EMG blood tests were also carried out to identify the possible cause of symptoms or any underlying pathology.

Data was analysed using SPSS version 26. Frequency and percentages were used for categorical data while mean and standard deviations were reported for numerical data. Shapiro Wilk test was used to find out normality of the data.

RESULTS

Five hundred forty-three (87%) patients were diagnosed with discogenic sciatica while 81(13%) patients were categorized under non discogenic disorders causing radicular symptoms. There were 95(17%) patients among discogenic sciatica group who had undergone discectomy in the past. Mean age of patients

were 44 ±3 with the age range of 20-64. Majority of the patients 51(63%) were males as compared to females 30(37%) in the non-discogenic group. Out of 81 cases diagnosed with non-discogenic sciatica, 26 cases (32%) were due to spinal tumors, facet dysfunction 10(12%), piriformis syndrome6(7%), cluneal nerve disorder2(2%), quadratus lumborum dysfunction4(5%), osteoarthritis of the hip3(4%),peripheral nerve disorders 8(10%),sacroiliac joint 3(4%) infections 10(13%),trauma to gluteal region 3(4%),pregnancy associated sciatica 2(2%),compressive neuropathy 4(5%). Schwannoma was the most common tumour affecting the nerve roots 18(70%), followed by extraspinal tumours 4(16%). Out of four patients(5%) suffering from compressive neuropathies 2(50%) cases were of lateral cutaneous nerve of the thigh while one case(25%) was attributed to common peroneal nerve and sural nerve.

The results of our study demonstrated significant case of a 27-year-old male who had a disc herniation at L5/S1 level evident by MRI and at the same level a tumour compressing on the neural structures. Therefore, the patient wasn't categorized in either discogenic or non-discogenic aetiology.

DISCUSSION

Long lasting symptoms of lumber radiculopathy which are unresponsive to medications, rest or physical therapy raises the possibility of non-discogenic or peripheral and systemic cause of sciatica.[20] In this study we assessed the incidence of non-disco genic disorders mimicking symptoms of sciatica.

Several intraspinal and extraspinal pathologies are related with the lumber radiculopathy and sciatica. A study conducted Ali T. AbdulWahid evaluated 600 patients presenting with features of sciatica, out of which 104(17%) patients were diagnosed with different non discogenic disorders.[21] These findings are consistent with our study as 81(13%) patients were reported to have non discogenic cause while the remaining were due to disc diseases. These findings illustrate that although non discogenic disorders are uncommon but can present with the sign and symptoms mimicking sciatica and so should be thoroughly assessed and managed accordingly.

In rare cases, both discogenic and non-discogenic pathologies can compress the sciatic nerve at the same time. Thamer Ahmed Hamdan and his colleagues demonstrated such a case of 35-year-old lady, MRI findings suggested disc herniation and at L4-L5 while L4 nerve root schwanomma at the same level. Our report of 624 patients also highlighted such a case in a 27 year old male. [22] These findings shows that sciatica can be a complicated symptom to diagnose and manage and the clinician should always consider extraspinal or systemic causes in the examination for better clinical decision making.

The report of 104 patients diagnosed with non-discogenic sciatica in the study conducted by Ali T. AbdulWahid reported [21] the most common causes of non-discogenic sciatica which were peripheral neuropathy (30%) while in our study peripheral nerve disorders were present In 10%. Peripheral neuropathy was followed by peripheral vascular disorders (19.2%) while in contrast no such case was observed in our study. Entrapment neuropathies were 6.5% and in our study was diagnosed in 5% cases.

Several other rare non discogenic causes of sciatica are reported in the literature. Such examples are sciatic nerve schwannoma, common peroneal nerve schwanomma [23-25] peripheral nerve sheath tumors, intrapelvic sciatic notch schwannoma [26, 27], osteoma in the lumber spinal canal,[28] discal cyst, [29] swollen inferior gamellus muscle with accompanying hematoma.[30] It is imperative for clinicians to use a well-defined algorithm of assessment plan for patients with sciatica symptoms to correctly identify the root cause involved and then manage or refer accordingly.

Superior cluneal nerve which have its origin from T12 to L5 and can be entrapped at the L4-L5 lateral branches when passing through thoracolumbar fascia over the iliac crest can cause pseudo sciatica with symptoms mimicking lumber radiculopathy. [31] 2 cases of superior cluneal nerve entrapment were also reported in our study.

This study gave an insight and documented the rare causes of sciatica encountered in an outpatient department of Peshawar. Future studies of longer duration using extensive diagnostic and assessment methods should be

carried out to further increase our knowledge of the subject.

CONCLUSION

A number of non-discogenic pathologies were identified in our study including Spinal Tumors, Facet Dysfunction, Infections, Piriformis Syndrome, Compressive Neuropathy, sacroiliac joint dysfunction and cluneal nerve disorder. Identifying the underlying non discogenic cause is still challenging. Considering the possible pathologies, detailed history taking and objective examination along with diagnostic tests and investigations can lead to the identification of underlying pathologies and their management.

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Table 1: Etiologies causing back and leg pain

Etiologies causing back and leg pain	Examples
Arthrogenic causes [15]	Dysfunction of Facet, hip joint or sacroiliac joint
Muscular causes [16]	Piriformis, quadratus lumborum
Neurogenic causes [17]	Dural or nerve tightness
Discogenic causes [18]	Intraspinal nerve root involvement, disc herniations
Psychogenic causes [19]	Central sensitization

Table 2: Incidence of Non Discogenic Sciatica

Incidence of Non Discogenic Sciatica	Frequency/Percentages
Discogenic sciatica	543(87%)
Non discogenic sciatica	81(13%)

Table 3: Mean age and gender distribution among non-discogenic group

Variables	Frequency/Percentages
Mean age	44±3
Male	51(63%)
Female	30(37%)

Table 4: Causes of non-discogenic disorders

Non discogenic disorders	Frequency/Percentages
Spinal Tumors	26(32%)
Facet Dysfunction	10(12%)
Infections	10(13%)
Peripheral Nerve Disorders	8(10%)
Piriformis Syndrome	6(7%)
Compressive Neuropathy	4(5%)
Quadratus Lumborum Dysfunction	4(5%)
Osteoarthritis Of The Hip	3(4%)
Sacroiliac Joint	3(4%)
Trauma To Gluteal Region	3(4%)
Pregnancy Associated Sciatica	2(2%)
Cluneal Nerve Disorder	2(2%)

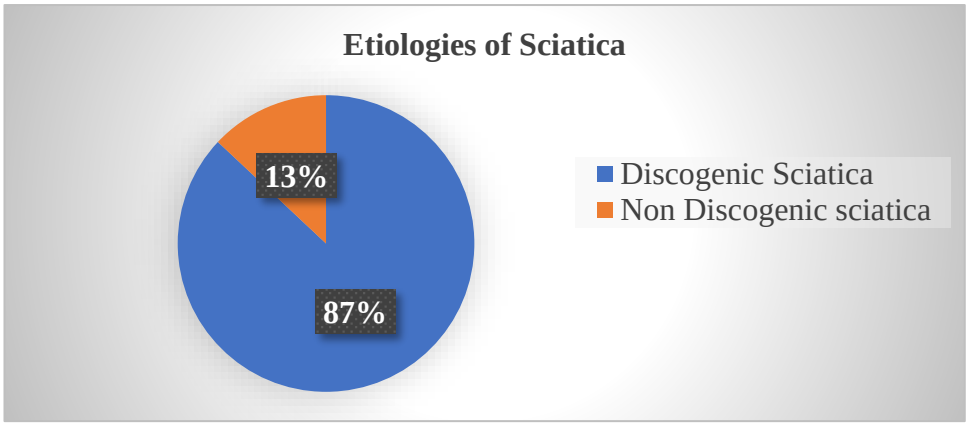

Figure 1: Pie chart demonstrating incidence of non-discogenic sciatica