

Incidence of symptomatic spondylolithiasis in Northern Ghana

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Abstract: *Background:* Low back pain disorders are an increasingly common and costly health problems in the western countries. For these patients, the return to work is their most important input to outcome measure of medical care. The incidence of spondylolithiasis varies from place to place, age, sex, association with certain disease states, fall from heights, previous road traffic accidents (trauma) among others. Conservative therapy is usually the initial treatment of choice. In Northern Ghana many people complain of low back pain, yet there has not been any scientific study on the incidence of lumbar spine spondylolithiasis. The aim of the present study is to retrospectively investigate the incidence of lumbar spondylolithiasis in Northern Ghana. *Study Design:* Retrospective. *Place and Duration:* Tania Specialist Orthopaedic Hospital, Tamale, Ghana, from January 2010 -December 2013. *Methodology:* Data regarding patient's age, sex and radiographic interpretations were retrieved and entered for analysis from January 2010- December 2013. *Results:* The incidence of symptomatic lumbar spondylolithiasis over the study period was 6.02% of all orthopaedic cases that reported to Tania Specialist Orthopaedic Hospital. Majority of the patients 219(75.78%) of symptomatic spondylolithiasis were aged 20-59 years. From this age group 121 patients (55.25 %) were females. Out of a total of 289 patients who reported with the condition over the four (4) year period, 129 cases (44.64%) were males and 160 patients (55.36%) were females. The male to female ratio was 1:1.2. The year with the highest reporting cases was 2011 recording 110 patients, representing 38.06%. Majority of patients 262 (90.66%) were managed conservatively, while only 27 cases (9.34 %) had decompression laminectomy surgery done. The total number of orthopaedic cases within the period under review was 4,800. *Conclusion:* The incidence of symptomatic spondylolithiasis among the study subjects was relatively high (6.02%). Most were females in their active youthful years and majority of cases were managed conservatively.

Keywords: Symptomatic, Spinal, Lumbar Spondylolithiasis, Northern Ghana.

Introduction

The lumbar vertebrae of the human anatomy connect the thoracic spine to the pelvis. These vertebrae are designated L1–L5 starting at the top. The lumbar vertebrae help support the weight of the body and permit movement [1]. These lumbar vertebrae also provide an avenue for the sciatic nerve and its roots to innervate the lower limb, gluteal region and some intrapelvic structures. The sciatic nerve is the largest nerve in the human body and begins from nerve roots in the lumbar spinal cord in the low back(lumbar region) and extends through the buttock area, to send nerve endings(both sensory and motor) down the rest of the lower limb [1-2].

Spondylolithiasis is defined as one vertebra slips forward or backward compared to the next vertebra. Forward slippage of an upper vertebra on a lower vertebra is termed anterolithiasis,

while backward slippage is referred to as retrolithiasis. The 5th lumbar vertebra is the most commonly affected vertebra usually after a break or fracture; spondylolysis is a defect or fracture of the pars-interarticularis of the vertebral arch, and it is a common cause of spondylolithiasis [1, 3-4].

Spondylolithiasis can be classified as symptomatic or asymptomatic. It can also be classified in relation to its cause; as Isthmic or pars-interarticularis or spondylolytic spondylolithiasis, which is the most common form. Its prevalence rate is 5-7% in American population [5-10]. Degenerative spondylolithiasis is a disease of the older adult that develops as a result of facet arthritis and joint remodeling or joint arthritis and ligamentum flavum hypertrophy or may result from acute fractures in the neural arch other than the pars-interarticularis [6-11].

The pathologic type is associated with damage to the posterior elements of the vertebra from metastasis or metabolic diseases or paget disease or tuberculosis or giant-cell tumor. Dysphastic or congenital spondylolithiasis occurs because of malformation of the lumbosacral junction, resulting in small, incompetent facet joint [4-6, 12]. Lumbar spondylolithiasis was first described in 1782 by a Belgian obstetrician, Herbinaux. He reported of a bony prominence anterior to the sacrum that obstructed the vagina from a small number of patients. The causes of the condition include trauma, tumor, degenerative activities and birth defects. Literature states that most people with spondylolithiasis are asymptomatic (having the disease, but without symptoms). The risk factors include family history of back problems, repetitive trauma, hyper-flexion of lumbar spine, athletics, football game, gymnastics and weight-lifting activities [2, 4, 7-8].

Signs and symptoms of spondylolithiasis include low back pain radiating to thigh, leg and foot, leg pains worsen after exercises, hamstring tightness, numbness, tingling sensation in the legs and weakness of the legs; others are loss of bladder and/or bowel functions or caudaequine [6-8]. Diagnosis is usually confirmed with radiography, CT-scan (computerized tomographic scan) or MRI (magnetic resonance imaging) of the lumbar spine. The CT- scan or MRI helps identify compression of the nerve(s) associated with spondylolithiasis. PET-scan (positron emission tomography) can also be used to determine if the bone at the defect is active or not. Grading of spondylolithiasis is as follows; grade 1, less than/equal to 25%; grade 2, 26% -50%; grade 3, 51% -75%; grade 4, 76% -100%; and grade 5, vertebra has completely fallen off the next vertebra [1-2, 7-8].

Majority of patients with lumbar spondylolithiasis are usually treated conservatively, consisting of activity modification, use of NSAID (non-steroidal anti-inflammatory drugs) drugs and physical therapy consultation (evaluation and addressing postural and compensatory movement anomalies) [9-16]. Failure of conservative therapy or spondylolithiasis with spinal stenosis are the common indications for spine surgery among adult patients [10-16]. The incidence of spondylolithiasis varies from place to place, age, sex, association with certain disease states, fall

from heights, previous road traffic accidents (trauma) among others. In Northern Ghana many people complain of low back pain, yet there has not been any scientific study on the incidence of lumbar spine spondylolithiasis. The aim of the present study is to retrospectively investigate the incidence of lumbar spondylolithiasis in Northern Ghana.

Material and Methods

This study was conducted retrospectively over a four year period at Tania specialist hospital, Tamale, Ghana, from January 2010 -to-December 2013. All patients who reported to the hospital with symptomatic low back pain were included in the study. Patient's age and sex were recorded. Every patient was also clinically and radiologically evaluated. Patients with severe low back pain localized or radiating to the buttock(s) and/ or leg(s) had plain radiograph and CT-scan ran on them. In this part of the world there is still no MRI or PET, so none were done.

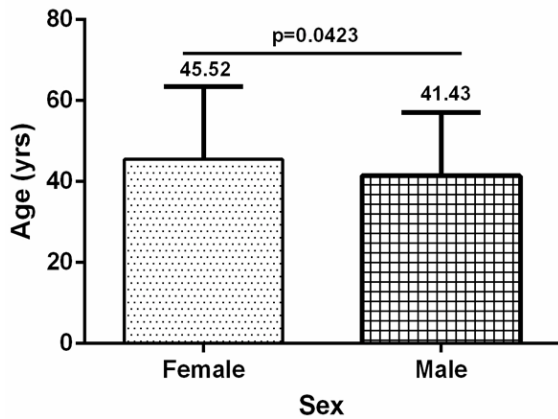
A total of 289 symptomatic spondylolithiasis cases were recorded during the period of the study, out of a total of 4,800 orthopaedic cases for same period. The condition was classified using the grading slip grade; 1- to- grade 5. Surgical operation was recommended for patients with spondylolithiasis and spinal canal stenosis with/ without nerve root compression or patients with failed conservative therapy. All others were managed conservatively, consisting of activity modification, NSAID drugs and physical therapy consultation (evaluation and addressing postural and compensatory movement anomalies). The follow-up schedule was: 1/7, 1/12, 3/12, 6/12, 9/12 and 12/12. The study was approved by the ethics committee for human research of the School of Medicine and Health Sciences of the University for Development Studies, Tamale, Ghana.

Results

A total number of 4,800 orthopaedic cases were seen over the 4 year period (2010 to 2013). Out of this, 289 cases representing 6.02% (289/4,800) of the total orthopaedic cases were diagnosed as symptomatic

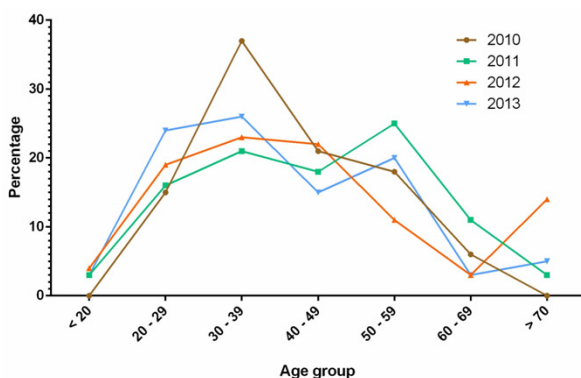
spondylolithiasis. This included 160 females (55.36%) and 129 males (44.64%) with mean ages of 45.52 ± 17.91 and 41.43 ± 15.69 respectively (fig 1).

Fig-1: Mean distribution of the age stratified by sex over the study period



Majority of the subjects 219(75.78%) with symptomatic spondylolithiasis were between the ages of 20-59 years as shown in (Fig 2). Out of this group, males constituted 108 patients (44.75%) and females were 121 patients (55.25%). The total number of patients who were recommended for surgery, and could afford the cost, were 27 cases (9.34%) out of 289 patients over the study period. The highest out-patient department patient attendance was recorded in 2011, consisting of 110 patients (38.06%) of the 289 symptomatic spondylolithiasis patients as shown in Fig.2. This was the year the National Health Insurance Scheme (NHIS) formally accredited the facility for its valid card bearing members. In this study, the male to female ratio of symptomatic spondylolithiasis was 1:1.2.

Fig-2: Incidence of symptomatic spondylolithiasis stratified by age and year group.



Discussion

The general incidence of symptomatic spondylolithiasis in this study was 6.02%. This is comparable to incidence in the United States of America as reported in [17-21] reported a 2:1 male to female ratio in asymptomatic spondylolithiasis cases. However, in the study we report a 1:1.2 male to female ratio for symptomatic spondylolithiasis cases. In Northern Ghana, females do a lot of weight-bearing related agricultural and economic activities. In addition, it is not uncommon to see even pregnant women carrying babies on their backs (lumbar spine), and still carrying head-load(s). According to the Food and Agricultural Organization [22] report, women constitute about 60-80% of Agricultural activities in Sub-Saharan Africa.

This may predispose them to spinal injuries. Also several women travel daily from far and near to places on bicycles, tri-cycles, motor-cycles and vehicles both good-conditioned and bad conditioned ones. All road users compete for space on narrow roads or on inmotorable roads resulting in accidents. According to previous studies motor traffic accidents accounted for about 20% fatalities in Ghana. In the Upper West Region of Ghana, it is 14.7% [23]. Reduction of these road traffic accidents may invariable reduce the number of spinal injuries, including Spondylolithiasis.

Majority of patients in this study with symptomatic spondylolithiasis (75.78%) were in the 20–59 year age group (Fig 2). This constitutes the youthful, active and economical group of our generally young Ghanaian population. This study did not consider the asymptomatic lumbar spondylolithiasis cases; therefore our figure may be the tip of the iceberg. Intensive public health education of the populace on spinal injuries will not be out of place.

The National Health Insurance Scheme (NHIS) accreditation of Tania specialist hospital in 2011, improved patients’ out-patient department attendants significantly, as seen in 2011 data, recording the highest, 110 patients (38.06%). Therefore the possible

inclusion of the spine surgical management cost component, will increase the number of patients needing and willing to consent for spine surgery.

Conservative therapy is the treatment of choice in general for Spondylolithiasis. In this study 90.66% of patients benefited generally from non-operative management. However, spinal surgery is still recommended for degenerative spondylolithiasis with spinal stenosis with or without nerve root compression among adults as well as conservative treatment failure cases. The 9.34% of patients who underwent spine surgery (decompression laminectomy), and had a postoperative follow-up period of over one year, reported no major complications.

Conclusion

Symptomatic Lumbar spine spondylolithiasis incidence is high (6.02%) in Northern Ghana. Majority of the patients who were inflicted with the disease were women and people within the age group of 20-59 years. Conservative therapy is still largely the treatment of choice. With the availability of radiographic machines and CT-scanners in Northern Ghana now, patients with incapacitating symptoms, abnormality resistant to non-operative measures, and significant slip progression, spine surgery is recommended. General population education on the spine, spine stress and prevention of spinal disease conditions is necessary now.

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