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Original Research Paper

Radio-Diagnosis

CLINICO- MRI PROFILE OF LUMBAR DISC HERNIATION ON SCIATIC LUMBAR PAIN IN BI-RIVER HOSPITAL SETTINGS (CASES OF KINSHASA AND BRAZZAVILLE)

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ABSTRACT **I. Objective:** to highlight the clinico-MRI profile of lumbar disc herniation on sciatic lumboradiculgia in bi-river hospital settings (cases of Kinshasa and Brazzaville). **II. Materials and methods:** This was a retrospective, documentary and multicenter study of 302 patients who performed lumbar MRI examinations in 18 months in hospitals in Kinshasa and Brazzaville. **III. Results:** The mean age of patients was 53.4 years. The most represented age group was 50 to 59 years old. The female sex was predominant (55.4%) with a ratio of 0.79. The majority of patients (68.2%) came from Kinshasa. Lumboradiculalgia was the most predominant indication with (49.3%), followed by low back pain (48%). The majority

of MRI examinations (91.4%) were performed without injection of contrast product. T1 and T2 weightings were performed in 100% of patients. Diseased disc degeneration was found at (41.7%) and lumbar disc herniation at (27.2%). The MRI examination was normal in (47%) of the patients. Based on potentially clinically positive relevance, only 48.7% of our MRI diagnoses were clinically positive. Age (p=0.000), lumboradiculalgia (p=0.000) and specialist physician prescription (0.039) had a statistically significant relationship with clinically positive diagnosis. **IV. Conclusion:** HDL is a pathological reality in the hospitals of Kinshasa and Brazzaville. The MRI profile found mainly corroborates the observations of the literature. Lumbar disc herniation and degenerative disc disease remain the most frequently encountered pathologies on magnetic resonance imaging in hospitals in Kinshasa and Brazzaville. They are at the origin of the lumbar spinal syndrome and affect the young population. The posterolateral disc herniation remains the most frequently encountered subtype with predominance of damage to the floors: L4-L5 and L5-S1.

KEYWORDS : MRI –Lumbar disc herniation – lumboradiculalgia- Sciatic lumbar pain.

INTRODUCTION

Lumbar disc herniation (HDL) is a major public health problem in the world [1]; of which disabling low back pain associated or not with sciatica is the clinical expression[2]. It is defined as a focal disc overhang containing, in addition to the annulus fibrosus, the nucleus pulposus, migrated from its central position to the periphery; more or less associated with the cartilaginous elements of the plateaus, the marginal listel, and the inflammatory tissue reacting to the presence of the nucleus pulposus [3]. According to the World Health Organization (WHO), HDL is the cause of 15% of absenteeism among heavy workers [1]. In France, low back pain is the most frequent reason for consultation in rheumatology with approximately 26% of hospitalized patients and 30% of outpatient consultations [4]. In the United States, 50 to 90% of Americans suffer from low back pain, which is the cause of severe occupational disability, and HDL is responsible for 1 to 30% of low back pain [5,6]. The incidence of HDL varies from one country to another; in Burkina Faso and Mali, 47% and 23.6% of cases, respectively, are reported [7,8]. The rate is quite low in Côte d'Ivoire and Tunisia, respectively 10.3% [9] and 2.2% [10]. In the DRC, observations made in Kinshasa by Kutoloka in 2002 reported an incidence of 4.3% of patients per year [11]. HDL is undoubtedly a reason for absenteeism from work and an alteration in the quality of life due to the professional incapacity that it causes. In France, approximately 37,000 surgical interventions for herniated discs are reported each year [4,12]. In England, the financial impact is estimated to be in the range of 16 to 50 billion US dollars [13]. However, it should be noted that medical imaging is useful in confirming the diagnosis before any surgical intervention. This is therefore an opportunity ask the profile MRI of the lumbar disc herniation in bi-river hospital environments. This is all the more relevant because, to our knowledge, no previous study has so far defined the profile MRI of the lumbar disc herniation in bi-river hospital environments (case of Kinshasa and Brazzaville). Given the above, we propose to describe the clinical-MRI profile of lumbar disc herniation on sciatic lumboradiculgia in bi-river hospital environments (case of Kinshasa and Brazzaville

MATERIALS AND METHODS

Nature of the study: We carried out a documentary and descriptive study from March 2019 to March 2020, i.e. a period of twelve months, and from December 2020 to June 2021, i.e. a period of six months.

Framework of the study: this is a multicenter study conducted simultaneously in Kinshasa at the NGALIEMA Clinic and in Brazzaville at the COGEMO Medical-Surgical Clinic in the radiology departments. The latter have an average daily attendance of 55 patients. At the Ngaliema clinic, we used a Philips brand MRI machine, ACHIEVA type, closed field with 1.5 Tesla permanent magnet manufactured in 2012, acquired in 2014 and put into service in 2016. On the other hand, at the medical-surgical clinic (COGEMO) in Brazzaville, we used a HITACHI brand MRI device, Type AIRIS COMFORT II, open field with permanent magnet of 0.35 Tesla manufactured in 2004, commissioned in 2006 and acquired in 2016 .as exploration protocols: The different protocols were adapted to the pathology sought, but generally the standard protocol for MRI examinations of the lumbar spine comprising the sagittal sequences T1 spin echo (SE), T2 spin echo (SE), T2 STIR and axial T2 spin echo. A slow direct intravenous injection of 0.1 mmol/kg or 0.2 ml/kg of Gadolinium was sometimes used in some patients to study the enhancement kinetics of the lesions observed. The duration of the examination was generally 20 to 30 minutes. The usual precautions and the various contraindications were strictly applied before any MRI examination.

Study population:were included in the present study; any male or female patient, aged at least ten to ninety years, of Congolese nationality (from the DRC and Congo Brazza) who has performed a lumbar spinal MRI and whose reports include all the variables interests sought; among other things: the complete identity of the patient, the anthropometric parameters (age and sex), the indication for the examination, the detailed radiological semiology as well as the conclusion. The following were not excluded in the present study: any patient with an incomplete file or not having MRI images on the PACS systems, any patient aged under 10 years or over ninety years old, at the end of having been outside the period.
Data collection: data collection was carried out on the basis of photocopied reports of lumbar MRI examinations carried out during the study period as well as the D.V.D of the images engraved for each patient from their archiving system , including IQ-Views on behalf of Brazzaville and Vision PACS on behalf of Clinique Ngaliema. The data was recorded and processed in a Microsoft Excel 2013 file. The parameters studied were: socio-demographic characteristics of the study population, indications for lumbar MRI examinations, MRI diagnoses, exploration technique and the profile of prescribing physicians.

Operational definitions: MRI diagnostic criteria: Were considered to be: Normal MRI: was represented by mild disc degeneration not likely to produce clinical symptoms. [30]. Were considered to be: Pathological MRI: Disc degeneration Disease: (degenerative disc disease): significant decrease in disc signal intensity, significant disc narrowing or disc bulging with or without compression of the nerve root or dural sheath such as evaluated on the T2 axial sequence. Disc herniation: focal disc protrusion from the nucleus pulposis through the uni or bilateral annulus fibrosis, with or without root compression. Foraminal disc herniation: was judged from a sagittal image with significantly narrowed intervertebral foramen and nerve root compression. Bulging degenerative disc disease: defined by the presence of a global disc overhang, conflicting or not, Lumbar spinal canal stenosis: This is an acquired or congenital narrowing of the central spinal canal or the lateral recesses. Central stenosis: antero-posterior diameter less than half that of the underlying stage. Lateral recess stenosis: narrowed lateral recess with compression of the nerve roots Foraminal stenosis: narrowing of a conjugation foramen likely to cause compression of the nerve root. Spondylolisthesis: sliding of the upper vertebra relative to the lower vertebra on sagittal views. Spondylodiscitis: significant modification of the IVD signal, of the vertebral bodies with or without structural damage, more

or less associated with an abscess of the paraspinal soft tissues. Zygarthrosis: degenerative rearrangements of the posterior articular apophyses with hypertrophy of the articular masses and narrowing of their joint spaces. Spinal and intra-spinal tumours: bone, epidural, intra-dural extra-medullary and intra-medullary tumours. Vertebral fractures: only fresh vertebral fractures were included with decreased signal intensity on T1 and increased signal intensity on T2. Fat deposits: defined by fatty degeneration of the spongy bone. Zygapophyseal and dural sac cysts: which are fluid signal tumor formations (hypo T1 and Hyper T2) as well as bone angiomas: were considered as incidentaloma, therefore excluded from the present study. All available MRI images were evaluated from the IQ-Views archiving system and Vision PACS to make the final diagnosis at lumbar spine MRI. Definition of potentially and clinically positive diagnosis: the diagnosis was classified .

Statistical analysis: the data collected were analyzed and processed using SPSS 27.0 software. The different data were subjected to a univariate, bivariate and multivariate analysis. With regard to the univariate analysis, the data were summarized in the form of tables or graphs for the categorical variables and the mean and its standard deviation or the median and its interquartile range depending on whether the distribution is symmetrical or not. In addition, for the bivariate analysis, the Pearson or Fisher exact Khi2 test was used to establish the relationship between the clinically potentially positive diagnosis and the variables retained in the study at the 5% threshold depending on whether the frequencies observed are greater than 5 or not. Finally, for the multivariate analysis, binary logistic regression was used to identify the factors associated with the clinically potentially positive diagnosis.

RESULTS

Sociodemographic characteristics of the study population .1.1. Sex: During the period of the present study, 302 lumbar spinal MRIs were included, including 44.4% men and 55.6% women, i.e. a sex ratio of 0.79% (Figure I, table III). 3.1.2 Age: the age of the patients varied between 10 and 91 years with an average age of 53.4 years; a standard deviation of 13.9 years. The 50-59 age group was the most represented with 27.2% (Table VII-VIII). The majority of women were between 40 and 49 years old, i.e. 26.2% of all women (Table VII-VIII). In addition, 33.6% of men are between 50 and 59 years old.

Origin of the patients: almost two thirds of the patients (61.3%) came from Kinshasa and 38.7% from Brazzaville (Table VII-VIII, Figure III).

Indications for MRI of the lumbar spine

Clinically, 49.3% of patients were referred for MRI for lumboradiculalgia; among the latter, 41.7% presented isolated lumboradiculalgia and 7.6% presented lumboradiculalgia associated with deficit neurological disorders (e.g. neurogenic claudication) followed by low back pain in a proportion of 48% including 1.3% associated with deficit neurological disorders (table II-IV, VI, VIII). Of all the women, 44% had isolated lumboradiculalgia and 7.7% lumboradiculalgia associated with deficit neurological disorders. In addition, of all the men, 38.8% had isolated lumboradiculalgia and 7.5% lumboradiculalgia associated with deficit neurological disorders (Table III, IV).

Technique and protocol for lumbar MRI examinations

More than ¾ (91.4%) of MRI examinations were performed without injection of contrast product. T1SE, T2SE and T2 STIR weighted sequences were performed during all MRI examinations. In the same vein, 61.3% of prescribing physicians were specialists; this means that the majority of physicians prescribing MRI examinations of the lumbar spine in this series were specialist physicians (Table V).

Diagnostic interpretation

Using the MRI diagnostic criteria, the MRI examination was unremarkable at the height (47%), followed by bulging degenerative disc disease (41.7%), of which 79% were conflicting and 21% non-conflicting; herniated disc (27.2%) including 89% conflicting and 11% non-conflicting (Table VI). In the majority of cases, the degenerative disco-vertebral changes were conflicting (79%) therefore potentially clinically significant (Table VII-VIII). Eighty-nine percent of the herniated discs were conflictual and therefore potentially clinically significant (table VII-VIII). Based on potential clinical relevance, using our definition of potentially clinically positive diagnosis, only 48.7% of all lumbar spine MRI scans were considered potentially clinically positive diagnosis (Table VII-VIII). The remaining 51.3% results were considered clinically negative ((Table VII-VIII).).

Factors associated with the rate of potentially clinically positive diagnoses. With regard to age, the majority of patients, i.e. 30.6%, whose age is between 50 and 59 years old, had a potentially clinically positive diagnosis (table VII-VIII). In addition, there is a statistically significant link between age and potentially positive diagnosis (p=0.000) (table VII-VIII). As for sex, in our entire series, 52.4% of women had a potentially clinically positive diagnosis (table VII-VIII). Furthermore, there is no statistically significant link between sex and potentially clinically significant diagnosis (p=0.161). In relation to the indications, 76.9% of the patients in our study referred for lumboradiculalgia (61.9% isolated and 15% associated with deficit neurological disorders) have a potentially clinically positive diagnosis. There is a statistically significant relationship between lumboradiculalgia and potentially clinically positive diagnosis (p=0.000). Regarding provenance, 66% of patients from Kinshasa had a potentially clinically positive diagnosis. There is no statistically significant link between the origin of the patients and the potentially clinically positive diagnosis (p=2.247). For the profile of prescribing physicians, it was noted that 66.7% of patients referred by specialist physicians had a potentially clinically positive diagnosis. Specialist prescribers were statistically significantly associated with a higher rate of potentially clinically positive lumbar MRI results (p=0.039) (Table VII-VIII).

DISCUSSION

Methodological approach: the present study is a retrospective survey whose interest was to take stock of the indications for lumbar spinal MRI in the diagnostic management of lumbar spinal pathologies in hospitals in Kinshasa and Brazzaville. This is the first time that the relevance of using MRI of the lumbar spine has been studied in these two countries. Our study revealed that the majority of lumbar spine MRI images did not identify any findings that could have potentially positive clinical significance, suggesting that lumbar spine MRI was significantly overused in our respective countries. Sometimes the clinical symptoms are strongly indicative of a lumbar MRI study but sometimes that did not identify significant findings, so MRI with negative results does not entirely represent inappropriate use of MRI as it can be used inappropriate for clinical symptoms without any positive results. On the other hand, the positive results of the lumbar MRI identified do not necessarily mean to have a clinical significance, because the MRI is not able to decide reliably on the symptomatic and asymptomatic spinal abnormalities [14]; some of them are incidental findings not responsible for common complaints. It should be noted that the clinically significant diagnosis rate identified of 48.7% in our study may represent a maximum rate of relevance for the use of MRI of the lumbar spine in hospitals in Kinshasa and Brazzaville. Any interpretation of our data must, however, take into account the limitations of our work. Indeed, the COGEMO Medico-surgical center which constituted our study framework in Brazzaville has a low-field MRI device (0.35 Tesla) with the

corollary of a relatively low spatial resolution likely to compromise the fineness of detail of the image. 'a picture. These data are similar to those found by Yu L et al [15] in China who reported a 41.3% relevance rate in their series. Studies from developed countries that used the ACR criteria [16], expert opinion [17] and other criteria derived from clinical guidelines [18,19] reported a clinically significant diagnosis rate ranging from 12 to 56.7%; this discrepancy in rates can be explained by the great heterogeneity of the populations studied but also by methodological differences.

Socio-demographic profile

Sex The distribution of patients according to sex shows a predominance of the female sex with 55.4% against 44.6% of the male sex, ie a sex ratio of 0.79. Compared to the international series, we note the same predominance for the female sex, like Gourmelin [20] in France who reported a sex ratio of 0.79. Our results can also be compared to those of Kpadonou in Benin, Ntsiba H in Congo and Douala in Cameroon [21–23]. Debbabi in Tunisia and Raid in Morocco [24,25] also found a female predominance among health workers, respectively at 51.6% against 48.4% for men and 73.8% against 26.1%. This clear female predominance in all these series could be linked to the great arduousness of the tasks assigned to women in the two countries, associated with the great multiparity and the characteristic hyperlordosis morphotype which may justify the high frequency of lumbar spinal complaints in African women. However, these results differ from those of Millogo [7]. in Burkina Faso where the male sex predominated with 66.1% against 33.8% for women. This discrepancy could be explained by the fact that the study population of Millogo consisted mainly of workers dedicated to heavy work handling the local factories. The majority of our patients were between 40 and 49 years old. These data are similar to those of Yu L. et al [15] in China. This could be explained by the fact that women in this age group considered to be active consult the doctor relatively more in the face of complaints considered to be more or less bothersome or persistent than much older women.

Age: It appears from this study that the average age of the patients was 53.4 years with extremes of 10 years and 91 years. Of the 302 patients included, 82 (27.2%) were in the age group of 50 to 59 years. These results are similar to those found by Yu L et al [15] in China and Schepper EIT et al [26] in the Netherlands who respectively reported a mean of 52.7 years with extremes of 3 to 100 years and 49 .9 years with extremes of 19 and 80 years. Our data are also close to those of Kakpovi K et al [27] in Togo who reported that the age group of 50 to 59 years was the most represented in 29.3%. Our results are however different from those of Jensen et al [28] in Denmark who reported a mean age of 41.6 years with extremes of 18 and 60 years. This discrepancy is explained by a difference in the methodological approach; indeed, if we conducted our study within the general population, the latter had as its source population elite riders from the city of Zurich, assumed to be sportingly active young adult subjects.

Origin; most of the patients in our series, 206 or 68.2%, came from Kinshasa. This can be explained by the fact that the duration of the study in Kinshasa was longer than that of Brazzaville, thus determining the respective sample size

Indications for MRI of the lumbar spine. Clinically, it was reported in our study that lumboradiculalgia constituted the most predominant indication with 49.3% of which 41.5% in their isolated form, 7.5% associated with neurological deficit disorders, followed by low back pain. with 48% including 46.7% in their isolated form and 1.3% associated with neurological deficit disorders and radiculalgia with 2.3%. Our results are close to those of Konstantinou K et al [29] in Sweden who reported in their series a predominance of lumboradiculalgia with 43%. However, our data are different from those found in the series by Yu L. et al [15] in China, which places low back pain in first place with 40%, followed by lumboradiculalgia with 27.7%. This difference could be explained by a lack of in-depth physical examination aiming to objectify lumboradiculalgia by resorting in particular to root stretching tests on the part of the prescribing physicians in our series. Our results are lower than those found by Tshibasu F. [30] in R.D. Congo which reported in its series an overall rate of lumboradiculalgia at 73.2% in all its clinical characteristics. This difference could be justified by the fact that the latter's study population only included patients with lumbar disc herniations. Epidemiological studies specifically investigating the population affected by lumboradiculalgia are rare and do not allow a comparison to be made with the data collected in this study. Only the overweight tendencies seem to correspond to the data found in the literature. Nevertheless, a review of the epidemiological literature in 2008 reported a lifetime prevalence of lumboradiculalgia ranging from 1.2% to 43% [31]. Of the 149 patients (49.3%) referred to MRI of the lumbar spine for lumboradiculalgia, 43 (28.8%) were between 50 and 59 years old and 87 (51.7%) were female versus 62 (46.3%) male. This female predominance in lumboradiculalgia could be explained by the fact that most African women are housewives and therefore subject to a sedentary life exposing them to excess weight which is one of the risk factors linked to the occurrence of lumboradiculalgia. . These data are contrary to those of NASRI [31] in France, which reported in its series a male predominance of 55.7% against 44.3% of women. This discrepancy can be explained by the difference in lifestyle in relation to the socio-professional profile of women in these two contexts. Kakpovi K et al [27] in Togo in their study on the prevalence of neuropathic pain in patients with common lumboradiculalgia also reported that the age group of 50-59 was the most represented in 29.3%.

Technique and protocol for MRI examinations. It appears from our study that the MRI examinations without injection of the contrast product were more represented and the T1SE, T2SE and T2STIR sequences were performed during all the examinations. Our data are similar to data from the literature which report that the injection of the contrast product during MRI examinations was reserved only for special cases, in particular when a tumor or infectious disease was suspected.

MRI diagnosis; It appears from our study that normal MRI was commonly found followed by disc degeneration and then disc herniation. Our results are similar to those of Yu L. et al [15] in China. However, the data of our series are contrary to those of the literature which reports degenerative disc disease as the most frequent diagnosis in MRI of the lumbar spine and to those found in the series of Schepper EIT et al. [26] in the Netherlands who reported only 6% of normal results. This discrepancy could be explained by the methodological difference with regard to the criteria for defining the MRI diagnosis used in our series; indeed, if in our series mild to moderate disco vertebral degeneration was considered normal, in the literature and in the series of authors cited above, all degenerative anomalies, whether mild or moderate, are considered to be pathological.

Factors associated with clinically positive MRI diagnosis. Sex; In this series, the female gender was predominant with a ratio of 0.79. Despite this female predominance, female sex was not significantly associated with clinically positive MRI diagnosis (p= 0.161). Our data differ from those of Yu L. et al [15] in China who reported a statistically significant relationship between gender and clinically significant MRI diagnosis. This difference could be explained by the larger study population in the series by Yu L. et al [15] in China. Age: the majority of patients in the age group of 50 to 59 years most represented in our study, i.e. 30.6%, had a potentially clinically significant MRI diagnosis. Our data reveal that an age trend had a statistically significant relationship with a high rate of

clinically positive diagnoses (p=0.000). The same finding was made by Yu L et al [15]. We do not have any literature data on this. Indications: Clinically, the data from our study reported that lumboradiculalgia was the predominant indication for MRI examinations of the lumbar spine, followed by low back pain, neurological deficit disorders and radiculalgia. Moreover, in our series, apart from low back pain, all the other complaints that indicated MRI examinations with a clear predominance of lumboradiculalgia were factors significantly associated with the existence of the clinically positive MRI diagnosis (OR=84,238, p= 0.000). Indeed, there is 84 times more risk for the patient with lumboradiculalgia to have a potentially clinically positive MRI diagnosis compared to those presenting with lumbago (OR=84.238; p=0.000). In addition, there is a 10 times greater risk for the patient presenting with radiculalgia to have a potentially clinically positive MRI diagnosis compared to those presenting with low back pain (OR=10.179; p=0.008). Finally, there is 11 times more risk for the patient presenting low back pain associated with deficit neurological disorders to have a potentially clinically significant diagnosis compared to those presenting isolated low back pain (OR= 11.091; p=0.000). These data are similar to those of Yu L. et al. [15] in China who reported in their series a statistically significant association between lumboradiculalgia (OR= 18.423, p=0.002), radiculalgia (OR = 14.326, p=0.083) and neurological deficit disorders (OR=12.214, p=0.001) at a high rate of clinically positive MRI diagnosis; moreover, the low back pain was not related to it. Shambrook J et al [32] in Great Britain also reported in their study on the clinical presentation of low back pain and association with risk factors according to the results of magnetic resonance imaging that low back pain and neurological deficit disorders were all two significantly associated with deviation/compression of the nerve roots (OR=2.5; OR=1.8), therefore with a significantly positive MRI diagnosis. Most of the studies, in particular those of Ouédraogo DD.et al, Douala BM. Et al, Attal N. et al [23,33,34], confirm that the presence of lumboradiculalgia and deficit neurological disorders were factors associated with the existence of a clinically positive MRI diagnosis. Origin: Our study shows that there were more patients from Kinshasa than from Brazzaville. Moreover, the origin of the patients was not a factor statistically associated with the clinically positive MRI diagnosis (p=2.247). Profile of prescribing physicians of all the patients in our series, the majority were referred by medical specialists against a minority referred by general practitioners. In addition, there is a statistically significant relationship between specialist prescribing physicians and clinically positive MRI diagnosis (p=0.039). These data are contrary to those found in the Netherlands by Schepper EIT. et al [26] where general practitioners were significantly associated with clinically positive MRI diagnosis. This discrepancy could be explained by the fact that in the series of these last authors, all the doctors prescribing MRI examinations of the lumbar spine were general practitioners. Collie DA et al [35] in Great Britain in their study on the diagnostic yield of MRI of the lumbar spine requested by general practitioners in comparison with specialist hospital clinicians reported a similar rate in the two groups. This balance can be explained by the probable existence of adequate, widespread and continuous professional training, particularly in the management of spinal disorders.

CONCLUSION

It emerges from this study that lumbar disc herniation is an entity frequently found in two-river hospitals. It affects young patients between 50 and 59 years old with an average age of around 53.4 years. Women are more affected than men with a ratio of 0.79. The majority of patients came from Kinshasa with the main complaint being lumboradiculgia (49.3%), followed by low back pain (48%). The majority of MRI examinations (91.4%) were performed without injection of contrast product. T1 and T2 weightings were performed in 100% of patients. Diseased disc degeneration was found at (41.7%) and lumbar disc herniation at (27.2%). The posterolateral hernia was the most frequently encountered subtype. The last three floors in particular: L3-L4, L4-L5 and L5-S1 were the most affected.

Limitation of the study

As a first limitation; we noted: - the use of a low-field MRI device (0.35 Tesla); indeed, the COGEMO Medico-surgical center which constituted our study framework in Brazzaville uses a 0.35 Tesla MRI device, with the corollary of a reduced spatial resolution; likely to compromise the fine detail of the images. These data are similar to those found by Yu L et al in China [16]. As a second limitation, we noted the great heterogeneity of the populations studied, including methodological differences that could negatively influence the results. Contribution of our study to knowledge. The present work is a retrospective and descriptive study whose mission is to highlight the clinical-MRI profile of lumbar disc herniation on sciatic lumboradiculgia in hospitals in Kinshasa and Brazzaville, the two closest capitals on the planet. It is a first to highlight the clinical-MRI profile of the herniated disc. It also made it possible to highlight the various lumbar spinal pathologies likely to cause lumbo radiculalgia in association or not with lumbar disc herniation.

Confidentiality of Data

The authors declare that this study does not contain any personal data that could identify the patient or subject.

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Conflict of Interest Statement: All the authors do not have any possible conflicts of interest.

Tables and figures: Figure 1. Distribution of the study population by gender, Figure 2. Distribution of patients according to age, Figure 3. Distribution of patients according to origin, Table I: Distribution of patients according to age groups, Table II: Distribution of patients according to indications for MRI of the lumbar spine, Table III. Comparison of the proportions of MRI indications by gender, Table IV: Comparison of the proportions of indications by origin, Table V. Breakdown of MRI examinations by technique, protocol and profile of the requesting physician, Table VI. Distribution of patients according to MRI diagnosis of the lumbar spine, Table VII. Association between the presence of clinically significant MRI findings and related factors. Table VIII: Distribution of patients according to the factors associated with the potentially clinically positive diagnosis; Table VIII: Distribution of patients according to the factors associated with the potentially clinically positive diagnosis.

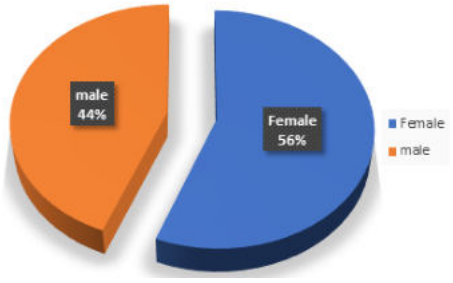

Figure I. Gender distribution of the study population: This figure shows a sligh female predominance

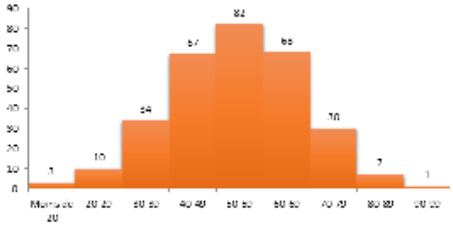

Figure II. Age distribution of patients: This figure shows that the majority of patients were in the age range of 50-59 years

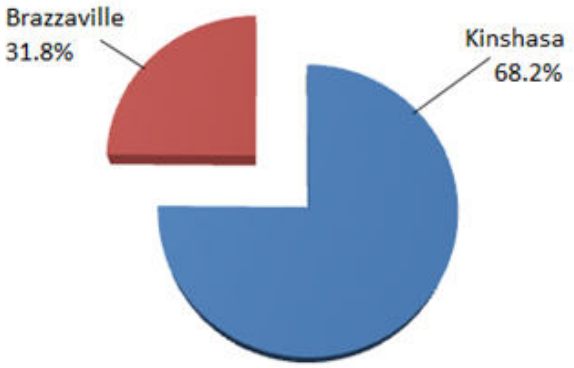

Figure III. Distribution of patients according to origin: this figure shows that the majority of our patients came from Kinshasa

Table I : Distribution of patients by age group.

Age	n=302	%
Less than 20	3	1,0
20-29	10	3,3
30-39	34	11,3
40-49	67	22,2
50-59	82	27,2
60-69	68	22,5
70-79	30	9,9
80-89	7	2,3
90-99	1	,3

Tablea II: Distribution of patients according to indications for spine MRI.

Indications	n=302	%
Low back pain	141	46,7
Radiculalgia	7	2,3
Lumbar radiculalgia	126	41,7
Lumbar radiculalgia associated with neurological deficit disorders	23	7,6
Low back pain associated with neurological deficit disorders	4	1,3
Other	1	0,3

Table III. Comparison of proportions of MRI indications by gender

Indications	Sexe			
	Masculin		Féminin	
	n=134	%	n=168	%
Low back pain	65	48,5%	76	45,2%
Radiculalgia	2	1,5%	5	3,0%
Lumbaradiculalgia	52	38,8%	74	44,0%
Lomboradiculalgia associated with neuro-logical deficit disorders	10	7,5%	13	7,7%
Low back pain associated with aux neurological deficit disorders	4	3,0%	0	0,0%
other	1	,7%	0	0,0%

Table IV : Comparison of the proportions of indications according to provenance.

Indications	Provenance				P
	Kinshasa		Brazzaville		
	n=206	%	n=96	%	
Low back pain	91	44,2%	50	52,1%	0,015
Radiculalgia	7	3,4%	0	0,0%	
Lumbaradiculalgia	91	44,2%	35	36,5%	
Lomboradiculalgia associated with neurological deficit disorders	16	7,8%	7	7,3%	
Low back pain associated with neurological deficit disorders	0	0,0%	4	4,2%	
other	1	,5%	0	0,0%	

Table V. Distribution of MRI examinations according to technique, protocol and profile of the requesting physician.

Technical	n=302	%
Without injection	276	91,4
With injection	26	8,6
Profile of prescribing doctors		
Specialist	185	61,3
Generalist	117	38,7

Table VI. Distribution of patients according to MRI diagnosis of the lumbar spine

Diagnostics	Modalities	n=302	%
Degenerative disc disease	No	176	58,3
	Yes	126	41,7
Herniated discs	No	220	72,8
	Yes	82	27,2
Zygarthrosis	Non	226	74,8
	Yes	76	25,2
Narrowed lumbar Canal	No	249	82,5
	Yes	53	17,5
Spondylolisthesis	No	280	92,7
	Yes	22	7,3
Spondylodiscitis	No	284	94,0
	Yes	18	6,0
Tumors	No	293	97,0
	Yes	9	3,0
Traumatic fracture	No	302	100,0
Spondyloarthropathy	No	302	100,0
Static disorders of spine	No	302	100,0
Normal	No	160	53,0
	Yes	142	47,0

Table VII. Association between the presence significant MRI finding and related factors.

Variables and modalities	Coefficient	p-value	GOLD	95% confidence interval	
				Inferior	Superior
Gender					
Male			1		
Female	-,473	,134	,623	,336	1,157
Age					
Less than 20			1		
20-29	18,986	,999	176079484,036	0,000	
30-39	19,290	,999	238640686,602	0,000	
40-49	19,729	,999	369964220,020	0,000	
50-59	20,120	,999	547196750,422	0,000	
60-69	20,015	,999	492691214,204	0,000	

70-79	21,614	,999	2437826527,882	0,000	
80-89	39,917	,999	216665387293027000,000	0,000	
90-99	42,048	,999	1825355544746950000,000	0,000	
Source					
Kinshasa			1		
Brazzaville	,298	,382	1,348	,691	2,630
Profile of the prescriber			1		
Specialist					
Generalist	-,483	,122	,617	,335	1,137
Indication					
Low back pain			1		
Radiculalgia	2,320	,008	10,179	1,855	55,842
Lumbar Radiculalgia	4,434	,000	84,238	10,469	677,837
Lumbar Radiculalgia associated with neurological deficit disorders	-19,592	1,000	,000	0,000	
Low back pain associated with neurological deficit disorders	2,406	,000	11,091	5,871	20,950
Other	21,793	,999	2914626815,232	0,000	
Constant	-21,144	,999	,000		

Table VIII: Distributor of patients according to factors associated with a potentially clinically positive diagnosis

Variables and modalities					P
	No		Yes		
	n=155	%	n=147	%	
Age					0,000
Less than 20	3	1,9%	0	0,0%	
20-29	8	5,2%	2	1,4%	
30-39	26	16,8%	8	5,4%	
40-49	41	26,5%	26	17,7%	
50-59	37	23,9%	45	30,6%	
60-69	35	22,6%	33	22,4%	
70-79	5	3,2%	25	17,0%	
90-99	0	0,0%	1	,7%	
Gender	155		147		0,161
Male	64	41,3%	70	47,6%	
Female	91	58,7%	77	52,4%	
Indication					0,000
Low back pain	115	74,2%	26	17,7%	
Radiculgia	3	1,9%	4	2,7%	
Lumboradiculalgia	35	22,6%	91	61,9%	
Neurological deficit disorders associated with Lumboradiculalgia	1	,6%	22	15,0%	
Neurological deficit disorders associated with low back pain	0	0,0%	4	2,7%	
Other	1	,6%	0	0,0%	
Region					2,247
Kinshasa	109	70,3%	97	66,0%	
Brazzaville	46	29,7%	50	34,0%	
Profile du prescriber					0,039
Specialist	87	56,1%	98	66,7%	
Generalist	68	43,9%	49	33,3%	

Figure 4. A 58-year-old female patient with paresthetic low back pain. A: T2 TSE-weighted sagittal section, passing through the lumbar spine, showing Pffirman's C-type degeneration in the last three floors. B: T1 TSE-weighted sagittal section, passing through the lumbar spine, showing a disc overhang: L3-L4 and L4-L5 and L5-S1. C. T2 STIR-weighted sagittal section, passing through the lumbar spine, showing Pffirman's C-type degeneration at the last three levels. T2 TSE axial section through the L3/L4 disc, showing a global disc overhangs on a Pffirman's C-type disc degeneration. E. T2 TSE axial section through the L4/L5 disc, showing a left medial and para-medial disc protrusion, with posterior migration over Pffirman's C-type disc degeneration; F. T2 TSE axial section through the L5/S1 disc, showing an overall disc Pffirman's C-type disc degeneration.

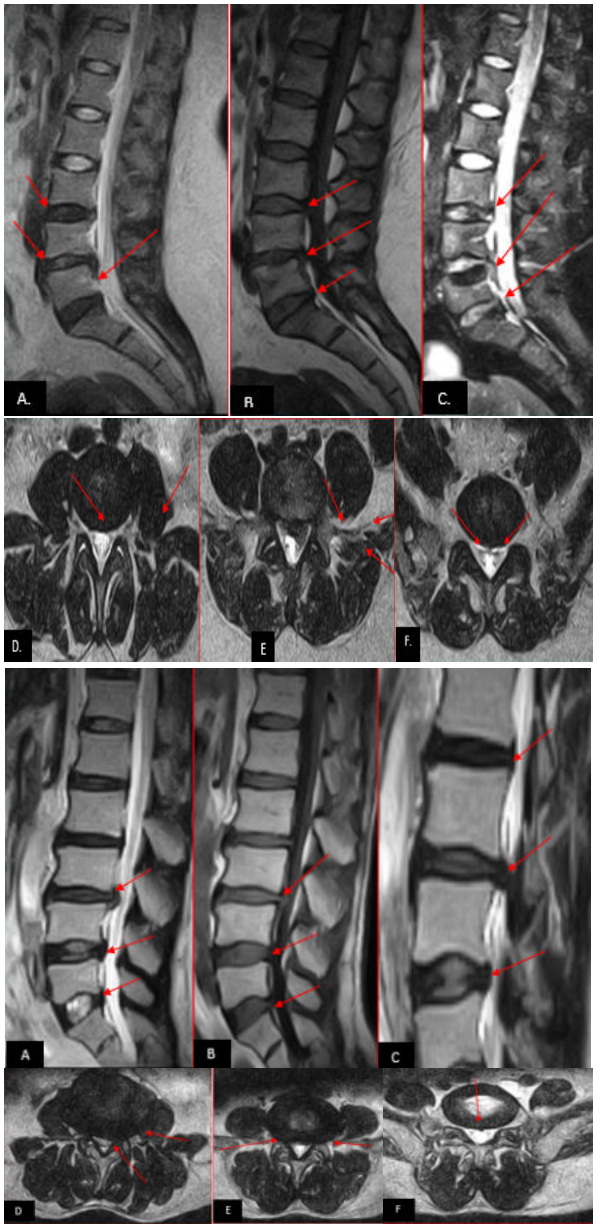

Figure 5. 47-year-old patient with hyperalgesic low back pain. A: T2 TSE-weighted sagittal section, passing through the lumbar spine, showing type C degeneration in L1-L2, L2-L3,

L3-L4 and type B: L5-S1 of Pffirman. B: T1 TSE-weighted sagittal section, passing through the lumbar spine, showing a multistage disc overhang: L2-L3, L3-L4, L4-L5 and L5-S1. C. T1 TSE weighted sagittal section, centered on the discs: L3-L4, L4-L5 and L5-S1. D.T2 TSE axial section passing through the L3/L4 disc, showing global disc overhang with left para-medial and foraminal disc protrusion on a background of Pffirman's type C disc degeneration. E. T2 TSE axial section through the L4/L5 disc, showing global disc overhang on a background of Pffirman's C-type disc degeneration. E. T2 TSE axial section through the L4/L5 disc, showing global disc overhang on a background of Pffirman's C-type disc degeneration.

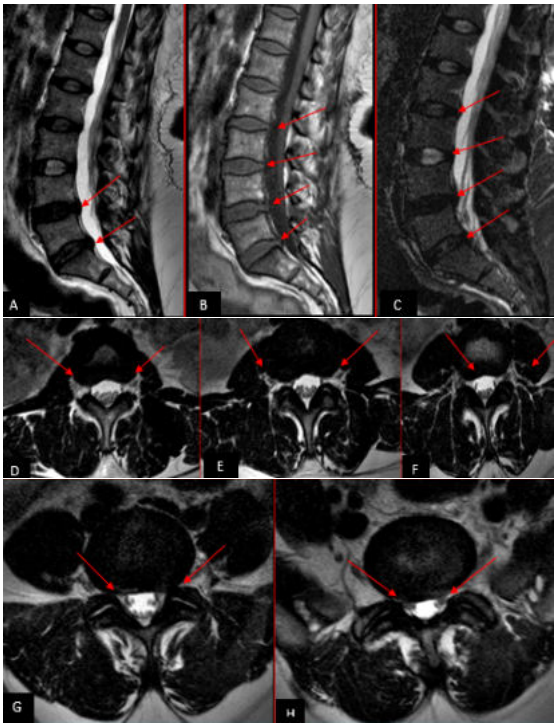

Figure 6 . A. 50-year-old female patient with lumbar low back pain. A: T2 TSE-weighted sagittal section, passing through the lumbar spine, showing Pffirman's C-type degeneration in L1-L2, L2-L3, L3-L4 and Pffirman D in L4-L5 and L5-S1 . B: T1 TSE-weighted sagittal section, passing through the lumbar spine, showing a disc overhang: L4-L5 and L5-S1. C. T2 STIR-weighted sagittal section, passing through the lumbar spine, showing Pffirman's C-type degeneration in L1-L2, L2-L3, L3-L4 and Pffirman D in L4-L5 and L5-S1. D-E-F: T2 TSE axial section through the L1-L2, L2-L3 and L3-L4 disc, showing disc degeneration; G and H. T2 TSE axial section through the L4-L5 and L5-S1 disc, showing an overall disc Pffirman's D-type disc degeneration.

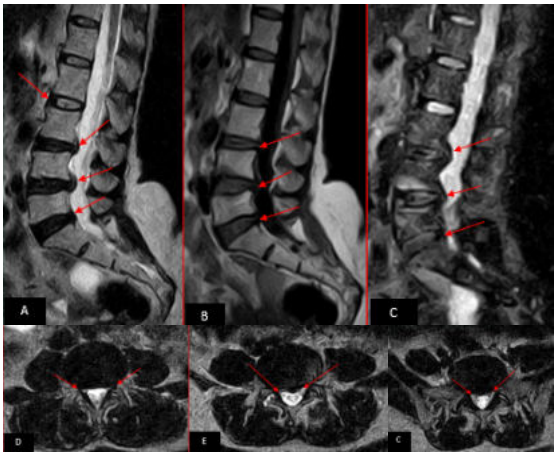

Figure 7. A 70-year-old female patient with low back pain. A: T2 TSE-weighted sagittal section, passing through the lumbar spine, showing Pffirman's D-type degeneration in the last three floors. B: T1 TSE-weighted sagittal section, passing through the lumbar spine, showing a disc overhang: L3-L4, L4-L5 and L5-S1. C. T2 STIR-weighted sagittal section, passing through the lumbar spine, showing Pffirman's D-type degeneration at the last three levels. D. T2 TSE axial section through the L3-L4 disc, showing a global disc overhangs on a Pffirman's D-type disc degeneration. E and C. T2 TSE axial section through the L4-L5 and L5-S1 disc, showing the medial disc protrusion, with Pffirman's D-type disc degeneration.

REFERENCES

1. WHO Expert Committee on Identification and Control of Work-Related Diseases, Organization WH. Identification and prevention of occupational diseases: report of a WHO Expert Committee [meeting in Geneva from 28 November to 2 December 1983]. 1985. World Health Organization https://apps.who.int/iris/handle/10665/40231. Accessed 12 April 2022.
2. Baron R, Binder A, Attal N, Casale R, Dickenson AH, Treede R. Neuropathic low back pain in clinical practice. Eur J Pain. 2016;20(6):861–873.
3. Resident's Manual, Radiodiagnosis-Neuroradiology Musculoskeletal system. tsunami. 2009.
4. Tonnonhi C. Herniated discs at the CHU Hubert Maga in Cotonou about 78 cases. 2004.
5. Rasmussen C, Nielsen GL, Hansen VK, Jensen OK, Schioettz-Christensen B. Rates of lumbar disc surgery before and after implementation of multidisciplinary nonsurgical spine clinics. Spine (Phila Pa 1976). 2005;30(21):2469–2473.
6. Deyo RA. Back surgery--who needs it? N Engl J Med. 2007;356(22):2239–2243. 7. Millogo A, Bamouni AY, Taoko A, Ki-Zerbo G, Sawadogo A, Yameogo A, et al. lumbosciatica: radioclinical and etiological profile at the bobo-dioulasso hospital center (burkina faso). Black African medicine. 1999;4.
8. Diarra M. Study of neurosurgical pathologies operated in the ortho-traumatology department of the Gabiel Touré Hospital about 106 cases. 2002.
9. N'zue MK, Akissi LN, Eti E, Daboiko J, Gabla A, Odi R, et al. Elementary epidemiological data on rheumatology in the Ivorian hospital environment. undefined. 1994. https://www.semanticscholar.org/paper/Donn%C3%A9es-%C3%A9pid%C3%A9miologiques-%C3%A9l%C3%A9mentaires-sur-la-en-N%27zue-Akissi/ c4298cc80806f7324dd69f008e4ad3d28e54aef9. Accessed April 13, 2022.
10. Younes M, Béjia I, Aguir Z, Letaief M, Hassen-Zrour S, Touzi M, et al. Prevalence and factors associated with common sciatica in a Tunisian urban population. Journal of Rheumatism. 2006;73(9):927–931.
11. Kutoloka M, Beltchika K, Panda N, Longo Mbenza B, Sumaili K, Fumu T, et al. Complications of surgical treatment of lumbar disc herniation at Kinshasa University Clinics: Retrospective analysis of 84 cases Complications of surgical treatment of lumbar disc herniation at Kinshasa University Hospital. African annals of medicine. 2011. https://anafrimed.net/complications-du-traitement-surgical-des-hernies-discales-lombaires-aux-cliniques-universitaires-de-kinshasa-analyse-retrospective-de-84-observations-complications-of- surgical-treatment-of-lumbar/. Accessed April 13, 2022.
12. Sandjon D. Cost of care for patients operated on in the traumatology and orthopedics department of the CHU Gabriel Touré from January to June 2003. Apropos of 130 cases. 2004.
13. Daste C, Boisson M, Laclau S, Lefèvre-Colau M, Rannou F, Nguyen C. Intradiscal treatments. Rev Rum Monogr. 2020;87(2):122–128.
14. Carragee E, Alamin T, Cheng I, Franklin T, van den Haak E, Hurwitz E. Are first-time episodes of serious LBP associated with new MRI findings? Spine J. 2006;6(6):624–635.
15. Yu L, Wang X, Lin X, Wang Y. The Use of Lumbar Spine Magnetic Resonance Imaging in Eastern China: Appropriateness and Related Factors. PLoS One. 2016;11(1):e0146369.
16. Davis PC, Wippold FJ, Brunberg JA, Cornelius RS, De La Paz RL, Dormont PD, et al. ACR Appropriateness Criteria on low back pain. J Am Coll Radiol. 2009;6(6):401–407.
17. Emery DJ, Shojania KG, Forster AJ, Mojaverian N, Feasby TE. Overuse of magnetic resonance imaging. JAMA Intern Med. 2013;173(9):823–825.
18. Lehnert BE, Bree RL. Analysis of appropriateness of outpatient CT and MRI referred from primary care clinics at an academic medical center: how critical is the need for improved decision support? J Am Coll Radiol. 2010;7(3):192–197.
19. Kovacs FM, Arana E, Royuela A, Cabrera A, Casillas C, Piñero P, et al. Appropriateness of lumbar spine magnetic resonance imaging in Spain. Eur J Radiol. 2013;82(6):1008–1014.
20. Gourmelen J, Chastang J-F, Ozguler A, Lanoë J-L, Ravaud J-F, Leclerc A. Frequency of low back pain in the French population aged 30 to 64. Results from two national surveys. Annals of Rehabilitation and Physical Medicine. 2007;50(8):633–639.
21. He A, Gm H, Dd NN, Gt K. results of rehabilitation treatment of low back pain followed at the cnhu-hkm in cotonou. rehabilitation results of low back pain treated in cnhu-hkm of cotonou. 2017;10.
22. Ntsiba H, Makosso E. COMMON LOW BACK PAIN: Apropos of 200 cases observed in the rheumatology department of the University Hospital of Brazzaville. undefined. 2009. https://www.semanticscholar.org/paper/LA-LOMBALGIE-COMMUNE%3A-A-propos-de-200-cas-observ%C3%A9s-Ntsiba Makosso/4e2812026d13451a582d1074fe580741b9ac47ea. Accessed April 9, 2022.
23. Doualla M, LumaN H, Yone EP, Balkissou A, Tchaleu NB, Motah M, et al. Clinical and radiological presentation of chronic low back pain in hospital consultation in Douala-Cameroon. undefined. 2014. https: //ww w.sem anticschoar.org/paper/Pr%C3%A9sentation-clinique-et-radiologique-de-la-

en-% C3%A0-Doualla L um aN/a f5515 93e55cf fa7ca2 7c5 0ab 336130 5cf1 87969 . Accessed April 9, 2022.
24. Debbabi F., Bouajina E., Rammeh N., Saad I., Mrizak N.. Low back pain risk factors among hospital staff. Risk factors for low back pain in hospital staff. 2006.
25. Chronic common low back pain in hospital staff. Survey of the Hassan II University Hospital of Fez – Hassan II University Hospital Center. http://www.chu-fes.ma/lombalgie-commune-chronique-chez-le-personnel-hospitalier-enquete-du-chu-hospitalier-hassan-ii-de-fes/. Accessed April 9, 2022.
26. Schepper EIT, Koes BW, Veldhuizen EFH, Oei EHG, Bierma-Zeinstra SMA, Luijsterburg PAJ. Prevalence of spinal pathology in patients presenting for lumbar MRI as referred from general practice. Family Pract. 2016;33(1):51–56. 26. Schepper EIT, Koes BW, Veldhuizen EFH, Oei EHG, Bierma-Zeinstra SMA, Luijsterburg PAJ. Prevalence of spinal pathology in patients presenting for lumbar MRI as referred from general practice. Family Pract. 2016;33(1):51–56.
27. Kakpovi K, Tagbor KC, Fianyo E, Doleagbenou AK, Guinhouya KM, Koffi-Tessio VES, et al. Prevalence of neuropathic pain in patients with common lumboradiculalgia in rheumatology consultation in Lomé (Togo). ESJ. 2017;13(24):267.
28. Jensen OK, Nielsen CV, Sørensen JS, Stengaard-Pedersen K. Back pain was less explained than leg pain: a cross-sectional study using magnetic resonance imaging in low back pain patients with and without radiculopathy. BMC Musculoskeletal Disord. 2015;16:374.
29. Konstantinou K, Dunn KM. Sciatica: review of epidemiological studies and prevalence estimates. Spine (Phila Pa 1976). 2008;33(22):2464–2472.
30. Tshibasu F. Epidemio-clinical and radiological aspects of lumbar disc herniation, specialization memory. 2017.
31. Nasri Y. Descriptive study of the management of lumbosciatalgia in the Emergency Structure of the Saint-Dié-des-Vosges Hospital Center. 2017; Not specified.
32. Shambrook J, McNee P, Harris CE, Kim M, Sampson M, Palmer KT, et al. Clinical presentation of low back pain and association with risk factors according to findings on magnetic resonance imaging. Bread. 2011;152(7):1659–1665.
33. Ouédraogo D-D, Nonguierma V, Napon C, Kabré A, Tiéno H, Guira O, et al. Prevalence of neuropathic pain among Black African patients suffering from common low back pain. Rheumatol Int. 2012 ;32(7) :2149–2153.
34. Attal N, Cruccu G, Haanpää M, Hansson P, Jensen TS, Nurmikko T, et al. EFNS guidelines on pharmacological treatment of neuropathic pain. Eur J Neurol. 2006;13(11):1153–1169.
35. Collie DA, Sellar RJ, Steyn JP, Cull RE. The diagnostic yield of magnetic resonance imaging (MRI) of the brain and spine requested by general practitioners: comparison with hospital clinicians. Br J Gen Pract. 1999;49(444):559–561.