

## Epidemiological and Clinical Profile of Cervicarthrosis Patients

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### Abstract

**Background:** More than 50% of people aged 40 years suffer from cervicarthrosis, This disease constitutes a public health problem. For this the decade 2001-2010 was declared by the WHO as “decade of the bones and joints”.

**Objective:** To determine the epidemiological and clinical profile of the Congolese patients suffering about cervical arthrosis and to study the evolution of modification of cervical lordosis with a view to improving physical treatment.

**Methods:** This case study was conducted at the University clinics of Kinshasa during the year 2011 to 2016. 35 patients' male and female, suffering about cervical arthrosis, were included. The different angulations of the cervical lordosis measured with an appropriate software. The height of the cervical spine measured by a caliper was 14 cm on average. The load exerted by the head on the cervical spine is directly function of lordosis and the height of the vertebra was calculated.

**Results:** Of the 35 patients, 34.3% men and 65.7 women. Age ranged from 30 to 80 years and the highest incidence of cervicarthrosis was between 61 and 65 years (20%). The clinic was dominated by cervical pain (80%) and irradiated pain in 37%. Other signs (blurred vision, headache, dizziness) were poorly represented. For radiographic signs: cervical lordosis was eliminated either decreased in 91% of cases, followed by inter-somatic pinching (68%), ductal stenosis (62%) and osteophytosis in only 20% of cases. However, osteoarthritic myelopathy is extremely rare (2%). Variation of the head load (in Kg) on each vertebra of the cervical spine from C1 to C7 and from 0 to 45° depending on the level of the vertebra and the degree of cervical lordosis. The force increases from C1 to C7 and from 45° to 0° following an arithmetic progression.

**Conclusion:** This study has just highlighted the importance of the cervical lordosis spine in the diagnosis of cervical arthrosis and showed the important role of cervical lordosis in the variation of head load on each vertebra.

**Keywords:** Cervicarthrosis; Epidemiology; Cervical lordosis; Cervicarthrosis DRC

### Introduction

The decade 2001-2010 was declared by the WHO as “decade of the bones and joints” [1,2]. Cervical arthritis is a severe degenerative disease that affects the cervical region. Disease of the bones and joints, it reaches the man generally to the quarantine. The pain caused by cervicarthrosis has an adverse impact on the quality of daily life, especially in the case of comorbidity. Neck pain is very common, with prevalence ranging from 14% to 43%, with a prevalence of 21% to 54% over one year, and an estimated life time prevalence of 70% in Western countries. They are mostly common neck pain, secondary to degenerative deterioration or a functional disorder of its osteoarticular, ligament or muscular structures. But they can reveal a serious condition that the emergency physician must recognize. Neck pain may become chronic in 22% of women and 16% of men and approximately 30% will lead to functional disability. Four clinical manifestations are often encountered, including: pure cervical syndrome, conjugated more commonly, basalar vertebral syndrome and rarely osteoarthritic myelopathy [3,4].

The medical treatment of the degenerative osteoarthritis generally is palliative, no medicine showed its efficiency to warn, reduce the progress or even invert the modifications anatomopathologies of the cervicarthrose to the people [5,6]. Some advice of lifestyle as to sleep with a cervical pillow, to maintain his neck in the warmth, to improve its working position as well as a and proprioceptive postural rehabilitation allows to limit second offenses [7].

The problem that arises in the current coverage is that certain forms of the cervical arthrosis result from the compression of the nervous roots through the holes of conjugations reduced by the degeneration loss of weight; to assure a real relief the cervical drive has to mobilize

a sufficient (self-important) strength capable of recreating a space allowing the relaxation of the record (disk) and at the same time the hole of conjugation. The determination of the profile of Congolese patients suffering about common rachialgia, as well as the understanding of the evolution of the constraints on the intervertebral discs, will help us to manage a strategy able to relieve these patients, by noninvasive methods, according to the recommendations of WHO [8].

### Theoretical framework of the study

It consists in measuring the different heights of the cervical column, which will allow to evaluate the stresses exerted on the column by the weight of the head and to study how these stresses vary according to the level of the vertebra and its degree of inclination the degree of lordosis [9].

### Operational definitions

Constraints on the cervical column: this is the load supported by the cervical column, proportional to the weight of the head and the degree of the cervical lordosis. Degree of cervical lordosis: This is the degree of curvature of the cervical lordosis, which is normally between 30 and

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45°. This lordosis is diminished or obliterated with the development of cervical lordosis.

### Experimental Method

This case study was conducted at the University clinics of Kinshasa during the year 2011 to 2016. 35 patients male and female, all suffering about cervical arthrosis diseases, were included in this study. In the Department of Physical Medicine and Rehabilitation, Articular-osteo unit, to the University Clinic of Kinshasa. A research protocol including the following data has been used: age and the sex of the patient, the weight of the patient, the clinical signs (cervical pains, cervical headaches, dizziness's, vision swindles, irradiated pains, limited movement, sensory disorders Only the patients having realized at least a radiography, or a CT-Scan or the MRI were included in this study.

### Calculation of cervical stresses

On a sitting patient, the trunk in a vertical position, (F) is the force exerted by the head on the cervical spine, this force being directly proportional to the product of the head mass by gravity (g), by the value of the angle of attack, Inclination of the vertebra (cos α), by the Height or (level of the vertebra) as expressed by the following formula (Tables 1- 5).

$$F = m \times g \times h \times \cos \alpha.$$

In this expression:

Sex	Effective	%
Males	12	34.3
Females	23	65.7
Total	35	100

Note: 35 patients were included in this study with a ratio of 1.9 in feminine ascendancy is 65.7%.

Table 1: Distribution of the patients by sex.

Age groups (years)	Effectiveness	%
30-34 yrs	06	17.1
35-40 yrs	04	11.4
41-45 yrs	00	00
46-50 yrs	03	8.6
51-55 yrs	02	5.7
56-60 yrs	06	17.1
61-65 yrs	07	20.0
66-70 yrs	05	14.3
71-75 yrs	00	00
76-80 yrs	02	5.7
Total	35	100

Note: The age bracket between 61 and 65 years is the most concerned. Let us note however a rarity between 76 and 80 years.

Table 2: Distribution of the patients by age groups.

Variables	Effectiveness	%
Cervical Pain	N= 28	80.0
Headaches	N= 6	17.1
Dizziness	N= 4	11.4
Vision Swindles	N= 3	8.5
Irradiated Pain	N= 13	37.1
Limited Movement	N= 11	31.4
Sensory Disorders	N= 7	20.0

Note: The cervical pain is the most frequent sign in the cervical rachialgies followed by pains irradiated on the other hand the disorders (confusions) of the vision are rare.

Table 3: Distribution of the patients by symptoms and clinical signs.

Variables	Effectiveness	%
Disappearance or diminution of cervical lordosis	N= 32	91.4
Interligne grip	N= 24	68.5
Osteophytes	N= 7	20.0
Stenosis of spine canal	N = 22	62.8
Myelopathic arthrosis	N = 2	5.7

Note: The disappearance of the cervical lordosis is the most frequent radiographic sign in the cervical arthrosis (91%), followed by plucking inter somatic (68%), the myelopathic arthrosis on the other hand is of an extreme rarity (5.7%).

Table 4: Distribution of the patients by signs of the medical imaging.

P	Degrés of lordosis	P	Degresof lordosis	P	Degree of lordosis
1	12°	13	20°	25	15°
2	20°	14	12°	26	20°
3	23°	15	1°	27	1°
4	33°	16	15°	28	12°
5	10°	17	1°	29	10°
6	30°	18	2°	30	10°
7	1°	19	10°	31	15°
8	10°	20	0°	32	20°
9	16°	21	22°	33	5°
10	8°	22	16°	34	25°
11	10°	23	15°	35	12°
12	33°	24	15°		

Note: Through this table all cervical lordosis values of the 35 patients (P) with cervicarthrosis are within the abnormal range of 0° to 35°

Table 5: Values of the variation of the cervical lordosis during cervicarthrosis.

F is the force (constraints) exerted by the head on the cervical spine;

M is the mass of the head;

Cos α determines the angle of inclination of the cervical vertebra with respect to the transverse plane.

H is the Height or (level of the vertebra).

G is the acceleration of earth gravity, equal to 9.72 m/s<sup>2</sup> in Kinshasa, according to formula:

$$g = 9.780318 \times (1 + 5.53024 \times 10^{-3} \times \sin^2(L) + 5.9 \times 10^{-6} \times \sin^2(2 \times L)) - 3.15 \times 10^{-7} \times h$$

L is the longitude of Kinshasa and

H is the average altitude of Kinshasa.

The different values of the cervical lordosis were automatically supplied by computer software from a support containing the radiographic images.

### Statistical analysis

No statistical analysis was performed. Data are tabulated and analyzed in percentages.

### Results

35 patients were included in this study, with a ratio of 1,9 in feminine ascendancy is 65,7%. The age bracket between 61 and 65 years is the most concerned, let us note however a rarity between 76 and 80 years (5,7%). The cervical pain is the most frequent sign in the cervical rachialgies, followed by pains irradiated. The disorders of the vision are rare. The disappearance of the cervical lordosis is the most frequent radiographic sign in the cervical arthrosis (91%), followed by plucking inter somatic (68%), the myelopathic arthrosis on the other hand is of an extreme rarity (5.7%). Through this table all cervical lordosis values

of the 35 patients (P) with cervicarthrosis are within the abnormal range of 0° to 35°. The variation of head load (in Kg) on each vertebra of the cervical column of C1 to C7 and from 0° to 45° according to the level of the vertebra and the degree of angulation of the cervical lordosis. The force increases from C1 to C7 and from 45° to 0° following an arithmetic progression.

## Discussion

This case study has highlighted the role of age as a major risk factor in the development of chronic cervical arthrosis in our country (DRC): 20% between the age of 61 and 65). This fact would probably be due to cumulative exposure to various risk factors and biologic changes that occur with aging that may make a joint less able to cope with adversity, such as cartilage thinning, weak muscle strength, poor proprioception, and oxidative damage. However, we have noted that after age 70, cervical arthrosis is rare or 2%. This is due to the fact that, according to the WHO report published in 2015, life expectancy in developing countries is 60 Years in Africa and only 51, 46 years in DRC, due probably to poverty and poor hygiene conditions [10,11].

According to our study, 65.7% of the population with cervicarthrosis was feminine. This upsurge in women, especially during menopause periods, may suggest the hormonal influence: progesterone and endrogene. But this argument is not unanimously supported by previous studies [12]. Pain from cervical arthrosis was a key symptom in our study (80% of patients), and it was the decision to seek medical care and is an important antecedent to disability. Especially in its complicated form of cervical myelopathy, it can compromise mobility and significantly reduce autonomy. One possible explanation could be the age-related interaction with work-related cervicalgia-like stressors (such as “prolonged static postures”) [13,14].

Irradiated pain in the upper limbs was the second key symptom in our study. This is results from the pinching of the nerve roots as a result of narrowing of the holes of conjugations. This pressure is increasing as the cervical lordosis disappears. This phenomenon, which has been studied, shows the need to readjust the traction load proportional to the patient's weight in order to obtain a clear decompression of the roots in suffering [12]. (Tables 1-5).

## About signs of the medical imaging

We observed a very high frequency of reduction or eradication of the cervical lordosis in 91.4% of cases and 68% of interstellar space. This leads us to conclude that these two elements constitute major signs for the diagnosis of cervical arthrosis. The loss of the cervical lordosis can already direct towards a management in physiotherapy and to prevent the occurrence of the crises of pain, such as cervicobrachial neuralgia This disturbance of the cervical lordosis may evolve for a long time and remain asymptomatic [13,14]. However, myelopathy is rare, present in only 2% of cases.

## Limitation of the sample

The small size of our sample constitutes a limit for this study. But the main reason is that the university clinics of Kinshasa is a tertiary level institution, it means that the patients who arrive are those who have not been relieved in peripheral hospitals and the second reason is that the majority of patients are not able to bear the high cost of the required para clinic examinations before being subjected to any treatment.

## The role of care manager in such context

The management of patients suffering from cervicarthrosis at the university clinics of Kinshasa involves several actors, first of all the

specialist physician (surgeon or rheumatologist), after para clinical investigations, the patient is referred to the department of physical medicine and rehabilitation, at this stage after evaluation by different assessment, the physiotherapist will be the main actor. Unlike the Leonardo project, nurses are not at all involved in this care and the patient also has a crucial role to play in the evolution of its management. Precisely in respect of the lifestyle and behavioral guidelines relating to behavioral therapy [15, 16].

## Conclusion

The present study confirms, like all others, that women suffer more cervical spinal pain than men and that is the diagnosis of this disorder is not based solely on the presence of osteophytosis but rather on the static of the cervical spine with lordosis reduced or deleted. This information is very useful because the straightness of the cervical spine causes an increase in cervical stresses and consequently the acceleration of the process of pinching the intervertebral spaces.

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