

## **Various Factors of the Internal and External Environment Affecting Coxoarthrosis**

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**Abstract:** Coxarthrosis, or hip osteoarthritis (OA), is one of the main causes of hip pain, which can affect patients of all ages, being one of the most common reasons for patients presenting to the specialized outpatient clinic. The objective of our research was to determine the number of patients with coxarthrosis who presented to the Department of Orthopaedics and Traumatology within the Emergency County Hospital of Drobeta Turnu Severin, between 2017-2019, the sex, age, social environment of the patients. All patients underwent a thorough clinical examination to determine the risk factors, the favouring factors and their correlation with the paraclinical data obtained through imaging investigation (pelvis X-ray, computer tomography and nuclear magnetic resonance). The study included 462 patients, aged between 23 and 89 years old, who were diagnosed with varying degrees of coxarthrosis within the specialized outpatient clinic. The main risk factors were obesity, osteoporosis, chronic smoking, rural environment, female sex, the existence of a hip injury and intense physical exertion. The main purpose of the research was to analyse a series of data, which would bring information on the incidence, distribution by age groups, sex, living environment and professional activity of the population with coxarthrosis, in order to develop a therapeutic management as effective as possible. Arthrosis is generally characterized by the loss of an important part of the joint cartilage, which causes local pain and reduced mobility.

**Keywords:** development, coxarthrosis, factors, diseases, statistics, development.

Arthrosis primarily affects the joints of the knees and hips, the most used joints in daily activities.

It affects about 9.6% of men and 18% of women over the age of 60 years old

Coxarthrosis or hip osteoarthritis (OA) is one of the most common pathologies for which patients present for a consultation in the polyclinic, in the physiotherapy, orthopaedics and traumatology departments [2, 3].

The disease is characterized by progressive biomechanical changes due to the damage of joint structures, destruction of articular cartilage, reduction of joint space and loss of joint mobility [4, 5].

Hip osteoarthritis is the most common diagnosis in adults who present with pain, functional impotence and limitation of joint movements of the hip.

Patients with coxarthrosis may also complain of pain in the buttocks, groin, thigh or knee, which are intensified by prolonged orthostatism.

The intensity of the pain can range from a nagging pain to a sharp or fierce pain.

Patients suffering from this pathology will often have problems walking, climbing stairs, carrying objects and dressing, arthrosis being the main contributor to limiting daily activities [6, 7].

Among adults over the age of 45 years old, the incidence rates for incipient coxarthrosis is about 37%, and for those with severe impairment, about 13%.

The overall incidence is estimated at 2.9 in 1000 individuals [8].

Studies showed that women are more commonly affected by coxarthrosis than men, with the incidence increasing with age (especially over 75 years old) and that African-Americans are at a lower risk than Caucasians [8, 9].

Risk factors that can be modifiable for coxarthrosis include heavy manual work, high body mass index (BMI), low education and socioeconomic status [10].

The risk factors that can not be changed for hip arthrosis are age, female sex, genetic predisposition and previous lesions of the hip joint.

Also smoking, alcohol consumption and intense sports activities can influence the onset of coxarthrosis [3,11, 12].

For the management of coxarthrosis, a number of conservative and surgical treatment options are available.

Conservative measures include physiotherapy exercises, to strengthen local muscles, complex exercises at the gym for weight loss, wearing shoes that absorb shocks caused by walking or running on rough terrain, and oral analgesics such as paracetamol and nonsteroidal anti-inflammatories (NSAIDs).

Intra-articular injections (with corticosteroids or hyaluronic acid), arthroscopy and arthroplasty are the available invasive (surgical) options, highly used at present [13].

Arthroplasty is the last treatment solution when the rest of the conservative methods fail.

It consists in the total replacement of the hip with synthetic materials, a surgery that revolutionized the treatment of elderly patients with coxarthrosis, restoring the quality of life with very good long-term results [14].

The management of coxarthrosis is responsible for the substantial costs brought to the health system and society, both through treatment and by reducing work productivity and early retirement [15].

Proper diagnosis and clinical management of coxarthrosis in the early stages is very important because proper treatment (drug, physiotherapist) can avoid hip replacement surgery.

The patients from the studied group were subjected to a clinical and paraclinical examination, monitoring the following data for every subject: age, gender, area of residence, frequency and nature of symptoms, the presence of pain and its characteristics (time of occurrence (at rest/on exertion), duration intensity, irradiation, means of pain reduction), intensity of daily physical effort, type of coxarthrosis (primary, secondary), the stage of coxarthrosis, associated risk factors [such as osteoporosis, obesity, body weight (BMI-body mass index), smoking], the presence of hip or skeletal trauma in medical history, sedentary lifestyle, the presence of comorbidities.

The inclusion criterion of the patients in the study was the presence of symptoms of coxarthrosis (pain, functional impotence with the limitation of joint movements of the hip) also confirmed by paraclinical investigations, namely classical x-ray images, magnetic resonance imaging (MRI) or computer-tomography (CT) when the classical x-ray examination did not provide sufficient imaging data.

The paraclinical examinations were completed by serological tests for the detection of a local or general inflammatory condition, as well as for the demonstration of some comorbidities that would contraindicate certain therapeutic procedures.

The staging of coxarthrosis for every patient was performed on the basis of the clinical examination, but also with the contribution of the simple pelvis X-ray that highlighted the morphological changes of the joint as well as their severity.

For staging the severity of local lesions and applying a treatment as appropriate as possible to each patient, we used the most well-known coxarthrosis classification system: the Kellgren and Lawrence system.

This classification proposes 4 stages of hip coxarthrosis:

- stage I (incipient coxarthrosis), possible medial narrowing of the joint space;
- stage II (mild coxarthrosis), permanent narrowing of the lower joint space, mild sclerosis;
- stage III (moderate coxarthrosis), marked narrowing of the joint space, mild osteophytes, sclerosis, femoral head and acetabulum deformity;
- stage IV (severe coxarthrosis), large osteophytes, complete loss of joint space with sclerosis and cysts, marked femoral head and acetabulum deformity.

The study was approved by the Ethics Committee of University of Medicine and Pharmacy of Craiova, and a written informed consent of the patients was obtained before enrolling them in this study.

Results Analysis of clinical data of the patient group

Analysis of the patient group by age

The 462 patients in the studied group were aged between 23 and 89 years old, with the average age of 64 years old.

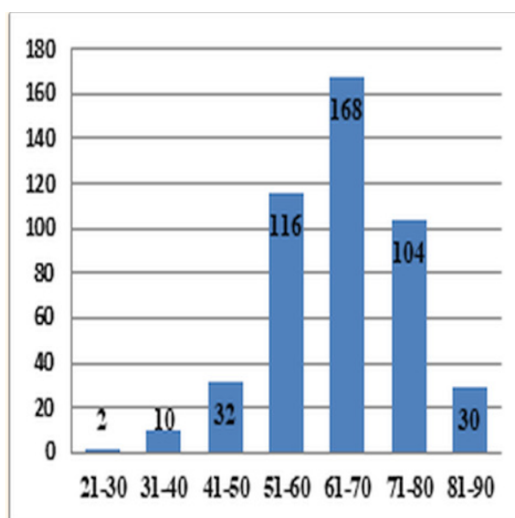


Fig1 Distribution of the patient's group by age

The results of the distribution of the number of patients by age group highlighted the following aspects:- the age group of 21-30 years old included only 2 patients (0.43%) with secondary coxarthrosis, in stage IV. The development of an advanced coxarthrosis at this age was explained by the presence of congenital hip dysplasia not treated during childhood.- between 31 and 40 years old, 10 patients were recorded (representing 2.16% of the total group);- in the age group of 41-50 years old, we found 32 patients, representing about 6.93% of the total group;- in the age group of 51-60 years old, there was recorded a number of 116 patients, representing 25.10% of the total group;- in the age group 61-70 years old, there was recorded a number of 168 patients, representing 36.37% of the total group;- in the age group of 71-80 years old, 104 patients were

recorded, representing 22.52% of the total group;- there were recorded 30 patients over the age of 80 years old included in the study group, representing 6.49% of the total group. The distribution of the patient group by age shows that hip osteoarthritis can be found even in young adults under 30 years old. As it results from our data, the incidence of the disease increases with age, most of the patients with coxarthrosis being diagnosed between 51 and 80 years old (about 84% of the total group). The decrease in incidence in people over 80 years old is due to the lower prevalence of people of the third age in the structure of society, many people dying after 80 years old, due to other comorbidities

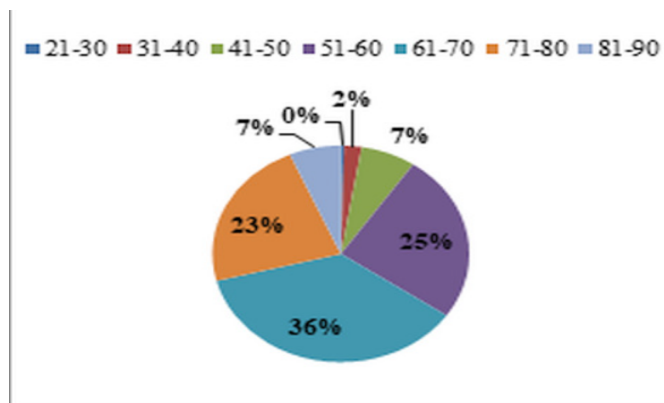


Fig2/ Percentage distribution of patients by age groups

Osteoarthritis (OA) is the most common joint disease and a leading cause of disability worldwide.

In recent years, OA became increasingly widespread in the elderly and increasingly obese population, placing a substantial burden on health systems through high social costs [16, 17].

Some studies showed that more than 300 million people would be affected by osteoarthritis worldwide [18, 19].

The risk of developing hip OA increases with age: about 28% of people over 45 years old show x-ray signs of hip osteoarthritis, and 9.7% develop symptomatic OA [20, 21].

In our study, from the beginning, we analyzed the distribution of the disease by age groups.

Following the analysis of the group, it was found that OA can occur in all age groups, but an increased frequency was recorded in patients over 50 years old.

Old age is strongly correlated with the onset of OA, which is a predominantly associated risk factor for the disease [2, 2].

Specialized studies estimated the prevalence of osteoarthrosis at about 5% in those aged between 15-44 years old, 25-30% in those aged between 45-64 years old and 65-90% in people over 65 years old [2].

There is an exponential increase in the onset of coxarthrosis after the age of 50 years old, and the strong association of age with the disease progression was attributed to the biochemical changes occurring in the hip joint.

These changes occur at the level of the bone matrix (consisting mainly of proteoglycans and collagen fibres), at the level of hyaline articular cartilage and joint synovial.

Also, chondrocytes in the elderly are less capable of producing proteoglycans to maintain the constitution of the cartilage matrix, making the joints more susceptible to arthrosis [2]. Females had an increased prevalence, being shown that women have a higher risk for developing coxarthrosis compared to men.

Several studies showed the presence of a smaller articular surface and a more pronounced narrowing of the joint space in women compared to males [2, 12].

This suggests that, in women, the cartilage loss can be an age-related phenomenon as well as to hormonal changes occurring with aging.

Oestrogen appears to have a beneficial effect on cartilage, which is demonstrated by postmenopausal oestrogen replacement therapy that protects older women against hip arthrosis [2]

Most of the patients in the study group came from rural areas (244 patients), with a link between the development of coxarthrosis and the increased physical requirements of rural occupations.

In general, studies showed high risks in the association of coxarthrosis with heavy manual labour and/or employment in agriculture or the construction industry.

It was suggested that increased levels of high-impact physical activity, through occupational exposure or long-term participation in physical activity, may predispose to the development of hip arthrosis. Epidemiological evidence suggested that occupations involving hard work have an increased risk of developing coxarthrosis.

The basic mechanism may be similar to that of obesity, by increasing the joint load that causes the biomechanical stress [6].

An extensive meta-analysis found that there is a relationship between body mass index (BMI) and the risk of developing hip osteoarthritis, with every five-unit increase in BMI being associated with an increased 11% risk for developing coxarthrosis.

This association was also found in our studied group, where 53% of the patients had  $BMI \geq 25 \text{ kg/m}^2$  presenting advanced stages of the disease, with major functional impotence and important x-ray changes [2].

Two mechanisms show the link between coxarthrosis and increased BMI.

Firstly, the increase in body weight increases the biomechanical load at the level of the hip joint, thus leading to high joint tensions, especially in the presence of other risk factors, and secondly, obesity, by which the associated systemic pro-inflammatory factors act on all systems and organs, including over the joint structures, increasing the risk of hip OA [3, 4].

The objectives of OA hip treatment in the patients of the studied group, focused on reducing pain, restoring mobility and muscle strength of the hip region.

The management of incipient and moderate coxarthrosis (stages II, III) consisted of lifestyle changes, such as smoking cessation, weight loss, limitation or avoidance of intense physical exercise, accompanied by pharmacological treatment and physio-kinotherapy [5].

The pharmacological treatment was carried out by local, oral and or injectable administration (intramuscularly or intravenously) of analgesics, muscle relaxants, glucosamine, chondroitin, steroidal and non-steroidal anti-inflammatories.

Diclofenac and etorcoxib were the most common NSAIDs recommended for hip pain relief, having a moderate effect in patients with early stages of OA (stages I, II and III).

The treatments we recommend are similar to those used in other similar studies [6].

Glucosamine and chondroitin were taken orally, these supplements providing joints with cartilage support, with benefits of relieving pain and slowing the progression of the disease [7].

Thermotherapy, electrotherapy, physical therapy and massage were the physical methods used in the treatment of pain symptoms and in the reduction of relapses.

Physio - kinesiotherapy is widely recommended in clinical guidelines for OA management, with evidence that exercise offers small to moderate benefits in reducing pain and improving function in hip arthrosis, which is also found in the studied group [10].

Intra-articular injections of corticosteroids or hyaluronic acid were used in a small number of patients (only 12 patients accepted the treatment procedure), but had a clinical result similar to that reported by other specialized studies, significantly relieving pain in the first week after the injection, followed by moderate reduction of symptoms after 8 weeks [1].

Total hip arthroplasty is an effective management approach for patients with coxarthrosis who exhausted the other non-surgical options, but this procedure requires substantial expenses for the health system

## Conclusions

Hip osteoarthritis (coxarthrosis) is one of the main causes of limiting daily activities and reducing the quality of life in the elderly, putting a lot of pressure on the medical system and causing economic and social problems, but also on the individual, family and community.

In this study, we observed the presence of coxarthrosis mainly in patients over 50 years old, with a higher incidence in women and patients from rural areas.

The main risk factors detected in patients in the study group were obesity, intense physical activity and the presence of other comorbidities.

The correct management of coxarthrosis has major benefits in relieving the symptoms by reducing the functional, social and economic impact of this pathology.

The GP, the orthopaedist and the medical recovery doctor play an important role in the early diagnosis and treatment of coxarthrosis, as well as for the prevention of the disease, stopping the disease progression and controlling the risk factors.

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