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Epidemiological Profile of Patients with Spondylodiscitis Treated at the Hospital Da Restauracao

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ABSTRACT

Introduction: Spondylodiscitis is a global term that includes vertebral osteomyelitis, spondylitis and discitis, representing approximately 3 to 5% of all cases of osteomyelitis. It occurs in around 0.5 to 2.5 cases per 100,000 inhabitants/year, with men being more affected. It has a bimodal peak incidence, the first peak up to 20 years and the second between 50 and 70 years. Most cases have an indication for non-surgical treatment, so surgery is reserved for specific cases.

Objective: To analyze the epidemiology of the population affected by spondylodiscitis and assess the response to surgical treatment.

Methods: We conducted a prospective cohort study in a tertiary center in Pernambuco, Recife, Brazil, investigating spondylodiscitis in all patients with back pain without a history of trauma or neurological deficit without a diagnosis of degenerative spine disease. The diagnosis of spondylodiscitis was confirmed in all cases with magnetic resonance imaging. The study period was two years.

Results: During the study period, we diagnosed 31 patients with spondylodiscitis, 58% were male, the mean age was 64.9 years, the main comorbidities were systemic arterial hypertension, dialysis renal failure and diabetes, previous non-neurological surgeries (Caesarean births, permanent vascular catheter for dialysis, cardiac surgery on the iac etc.) were identified as a risk factor, 58% of patients have motor weakness and L4-L5 were the most frequent level affected. Antibiotic therapy was used in accordance with current guidelines.

Conclusion: The clinical profile of our patients was 6 decades of life, male patients with neurological disabilities, clinical management has favorable results.

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Introduction

Spondylodiscitis is a group of infectious diseases that affect the vertebrae and intervertebral discs, consisting of vertebral osteomyelitis, spondylitis and discitis [1,2]. The main route of infection is hematogenous, but it can also occur through contiguous dissemination from adjacent tissues or direct inoculation during surgery [3]. In general, the incidence of vertebral osteomyelitis is around cases per 100,000 people and increases with age, with 0.3 cases per 100,000 people under the age of 20 and 6.5 cases per 100,000 people up to the age of 70 [2-5]. There are several factors that increase the chance of developing the disease, the main ones being diabetes mellitus, immunosuppression, renal failure on hemodialysis, liver disease and coronary heart disease [4,6]. The main causative agent is Staphylococcus aureus, followed by Escherichia coli. In patients undergoing spinal surgery, especially when the use of fixation devices is necessary, the main causative microorganisms are coagulase-negative Staphylococci and Propionibacterium acnes [4,6]. The clinical picture of these patients is usually characterized initially by back pain, with the lumbar spine being the most affected, followed by the thoracic and lumbar, respectively. The location of the pain depends on the site of the infection. It is also common to have fever and in some cases even neurological deficits such as weakness or paralysis of the limbs, radiculopathy, sensory loss and urinary retention. In cases where hematogenous dissemination occurs, it can also cause symptoms of skin infection, urinary tract infection, endocarditis and bursitis [4-6]. The diagnosis is made when the patient presents with a typical complaint associated with imaging changes suggestive of infection; in doubtful cases, analysis of inflammatory markers (C-reactive protein and erythrocyte sedimentation rate), which are

usually elevated, can be used. The causative agent of the infectious process is identified in the blood culture samples and treatment will be aimed at eradicating the microorganism, remembering that in situations where it is not possible to search for the causative agent, empirical antimicrobial therapy should be used until the microbiological diagnosis is established [5-7].

Figure 1: Infectious Inflammatory Process Affecting the Intervertebral Disc and Spreading to the Vertebral Bodies. Spondylodiscitis at Thoracic Level

Figure 2: Spondylodiscitis at L1 Level

Hypothesis
The severity of spondylodiscitis can vary according to its anatomical location.

Primary Objective
To describe the epidemiological profile of patients with spondylodiscitis who have undergone surgical treatment and are admitted to the Hospital da Restauração in Recife.

Secondary Objectives
- To determine the socioeconomic profile of patients diagnosed with spondylodiscitis undergoing treatment in the neurosurgery department of the HR-Recife.
- Describe the types of treatment.
- Establish the frequency and specific location (level in the spine) of the lesions.
- Describe the post-operative period.
- Establish the treatment regimen applied to patients admitted to and undergoing treatment at the neurosurgery service of the Hospital da Restauração in Recife.
- Determine the combination, duration and results of antibiotic treatment (effectiveness, efficacy) applied to inpatients and patients in the neurosurgery department at HR-Recife.

Proposed Methodology
This is a cross-sectional, analytical and prospective study divided into two stages, the first reviewing, capturing, filtering, tabulating and processing data from the medical records of patients with spondylodiscitis and the second capturing and following up patients with back pain, neurological alterations and a diagnosis of spondylodiscitis. The study included 31 patients from the Neurosurgery Service at Hospital da Restauração in Recife, Pernambuco, from January 2016 to December 2018 (two years) and targeted patients aged between 14 and 90 with back pain, neurological deficits and a history of infection.

Design
This is an observational, descriptive, prospective, cross-sectional study over the last two years.

Inclusion Criteria
- Back pain and fever, with no history of trauma.
- Neurological deficit with no history of coagulopathies or vascular diseases and trauma.
- Who are willing to take part in the study by signing the Informed Consent Form.
- Patients with clinical criteria confirmed by magnetic resonance imaging.

Exclusion Criteria
- Outpatients.
- Patients admitted to the emergency department, intensive care unit and burns unit.
- Patients with central nervous system disorders.
- Patients with a history of spinal trauma.
- Degenerative diseases of the spine.
- Patients who have undergone previous spinal surgery.
- Patients with a diagnosis not defined by MRI.

Risks
The research involves minimal risks for the participants.

Benefits
The research aims to identify risk factors associated with the development of spondylodiscitis, enabling the implementation of more effective preventive strategies and health promotion. From this perspective, the research aims to contribute to understanding the patterns of presentation of spondylodiscitis, with the aim of developing earlier diagnostic methods, allowing for more effective interventions and improving survival rates. In addition, the research provides valuable insights into the pathological incidence and its correlation with population groups, which will provide a more specific approach to clinical management.

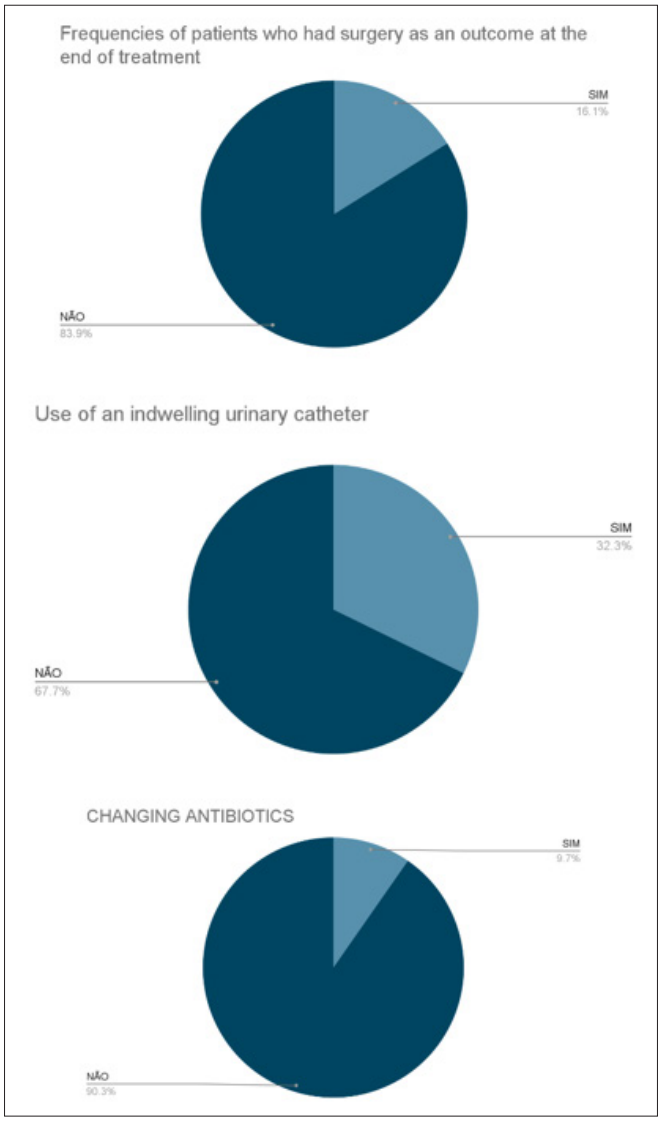
Discussion
The demographic profile observed, with an average age between 20 (twenty) and 70 (seventy) years, is in line/disagreement with the bimodal peak incidence described in the literature, the first being at 20 years and the second between 50 and 70 years. The predominance of men and the association with common comorbidities such as hypertension, renal failure and diabetes corroborate/do not

corroborate previous findings. The identification of previous non-neurological surgeries as a risk factor adds an important dimension to understanding the etiology, since male patients had an increased rate of peri- and post-operative complications, showing increased morbidity and mortality when compared to patients with no history of previous surgeries.

In terms of clinical manifestations, the presence of motor weakness in the patients highlights the importance of neurological assessment in spondylodiscitis. Imaging tests revealed that the most frequent location was the lumbar spine at L4-S1, which is consistent with the literature and reinforces clinical presentation patterns. In the period chosen for the study, 31 patients were diagnosed with spondylodiscitis, 58% of whom were male, with an average age of approximately 65 years. Analyzing the sample group, we noticed that 58% had motor weakness, the most damaged level being L4 -L5. Within this group, the most prevalent comorbidities were systemic arterial hypertension, dialysis renal failure and diabetes.

Treatment is conservative in most cases, with a surgical approach for refractory cases, with neurological deficit, progressive deformity or instability.The Infectious Diseases Society of America has published guidelines which, for the treatment of spinal infections, recommend the application of antibiotics according to the sensitivity of the culture and when the bacteria cannot be isolated. The indication of surgical treatment in specific cases, as mentioned in the introduction, is justified by the presence of motor weakness and may indicate a selective and personalized approach for each patient.

Antibiotic therapy, in accordance with current guidelines, highlights the importance of a multidisciplinary approach in the management of spondylodiscitis. The antibiotic therapy regimen was divided into three situations, and the average duration of treatment was 5 weeks. Patients with sterile cultures or positive for MRSA were prescribed dual therapy with vancomycin and Ciprofloxacin. When positive for ESBL E. coli, Meropenem or Piperacillin/Tazobactam and Ciprofloxacin were prescribed, and when positive for MSSA, Flucloxacillin was prescribed. The research carried out at the Hospital da Restauração in Recife revealed a higher prevalence rate than that found in the literature review studied. This is due to the difference in the study universe, which was larger in the reference study mentioned above, but with results obtained over a period of 09 years. From this perspective, the low prevalence of a disease could indicate a low incidence or a process of rapid disappearance of the person with the disease or condition, either because it is cured in a short time or because the patient dies. None of the patients in our study developed the infection after undergoing surgical procedures such as discography, epidural catheterization or pain blocks, so 24 of the patients with discitis were infected via the hematogenous route.



Variable	Results
Spondylodiscitis in male individuals	58,1% (18)
Average age	64,9 years
Occupation: Retired	22.6%.
Literate	54,8%.
Comorbidities	HAS=29,3%, Diabetes=19%, IRC=10,3%.
Previous surgeries	Cesarean section (7.6%). Hemodialysis fistula (7.6%).
Infections	ITU=29%.
Frankel Scale	E (41,9%);
Motor deficit	=58% in men;
Complications	Paraparesia=26%.
Location	predominant spinal cord injury= L-5 (42,1%).
Treatment	conservative(ATB)=100%.
Antibiotic change	
YES	3 (9,7%)
NO	28 (90,3%)

Conclusion

The epidemiological profile corresponds to retired male patients of a relatively young age, with an acceptable level of education, hypertensive, diabetic, susceptible to UTIs, with a high possibility of motor deficit and development of paraparesis due to thoracic injury, but with a good response to conservative treatment.

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