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Original article

Primary infectious spondylodiscitis in 51 patients over 75 years old: A comparative study[☆]

Jean-Jacques Dubost^{a,*}, Julien Lopez^a, Bruno Pereira^b, Benjamin Castagne^a, Anne Tournadre^a, Martin Soubrier^a, Marion Couderc^a

^a Rheumatology Department, Centre Hospitalier Universitaire Gabriel-Montpied, Clermont-Ferrand, France

^b Biostatistic Unit, Délégation à la Recherche Clinique et à l'Innovation (DRCI), Centre Hospitalier Universitaire Gabriel-Montpied, Clermont-Ferrand, France

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ABSTRACT

Background and objective: The incidence of infectious spondylodiscitis has been shown to rise with age; however, they had not been extensively investigated in the very elderly.

Material and methods: This retrospective, monocentric study included patients hospitalized in our department of rheumatology for primary infectious spondylodiscitis between 2000 and 2015, and compared over 75-year-olds with younger patients.

Results: Of the 152 patients, 51 (33.6%) were ≥ 75 years old, 59 were 61–74, and 42 were ≤ 60 . Patients ≥ 75 years old were more often institutionalized (7.8 vs. 0; $p = 0.02$), were less often subject to infection risk factors (27.5 vs. 54.5%; $p = 0.02$), but did not differ from the others as regards the frequency of diabetes and cancer. Time to diagnosis was shorter for the under 60-year-olds (23 vs. 30 vs. 30 day for each age group, respectively; $p < 0.05$). There were no differences among the age groups in terms of spondylodiscitis localization, frequency of neurological symptoms and fever, frequency or intensity of inflammatory syndrome, imaging use, frequency of microorganism identification, blood culture positivity, or use and efficacy of disco-vertebral biopsy. Microorganism distribution was comparable among the groups, except for Gram-negative bacilli, with *Escherichia coli* more common in over 75-year-olds (7/8 vs. 4/14; $p = 0.02$). Duration of antibiotherapy and hospitalization was comparable across the age groups. Five patients died, all over 75 years old (5/51 vs. 0/101; $p = 0.001$).

Conclusion: Age is a risk factor for primary spondylodiscitis, associated with significant mortality in over 75-year-olds (10%). For these elderly patients, spondylodiscitis does not bear any other distinguishing features.

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Espondilodiscitis infecciosa primaria en 51 pacientes mayores de 75 años: estudio comparativo

RESUMEN

Antecedentes y objetivo: Se ha demostrado que la incidencia de la espondilodiscitis infecciosa se incrementa con la edad; sin embargo, esto no ha sido investigado ampliamente en los mayores.

Material y métodos: Estudio retrospectivo, en un único centro, que incluyó a los pacientes hospitalizados en nuestro Departamento de Reumatología debido a espondilodiscitis infecciosa entre 2000 y 2015, y comparación de los pacientes mayores de 75 con los pacientes más jóvenes.

Palabras clave:

Espondilodiscitis infecciosa

Mayores

Osteomielitis vertebral

Característica del paciente

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* Corresponding author.

E-mail address: jjdubost@chu-clermontferrand.fr (J.-J. Dubost).

Resultados: De los 152 pacientes, 51 (33,6%) eran ≥ 75 años, 59 de entre 61 y 74, y 42 ≤ 60 . Los pacientes ≥ 75 estaban frecuentemente institucionalizados (7,8 frente a 0; $p=0,02$), estuvieron menos sujetos a los factores de riesgo de infección (27,5 frente a 54,5%; $p=0,02$), pero no difirieron del resto en cuanto a la frecuencia de diabetes y cáncer. El tiempo de diagnóstico fue menor para los pacientes menores de 60 años (23 frente a 30 frente a 30 días para cada grupo de edad, respectivamente; $p < 0,05$). No se produjeron diferencias entre los grupos de edad en términos de localización de la espondilodiscitis, frecuencia de síntomas neurológicos y fiebre, frecuencia o intensidad del síndrome inflamatorio, toma de imágenes, frecuencia de identificación de microorganismos, positividad del hemocultivo, o uso o eficacia de la biopsia discovevertebral. La distribución de los microorganismos fue comparable entre los grupos, exceptuando los bacilos gramnegativos, siendo *Escherichia coli* el más común en los pacientes mayores de 75 años (7/8 frente a 4/4; $p=0,02$). La duración del tratamiento antibiótico y la hospitalización fueron comparables entre los grupos de edad. Cinco pacientes fallecieron, todos ellos mayores de 75 años (5/51 frente a 0/101; $p=0,001$).

Conclusión: La edad es un factor de riesgo para la espondilodiscitis primaria, que se asocia a una mortalidad significativa en los pacientes mayores de 75 años (10%). Para estos pacientes mayores, la espondilodiscitis no comporta otras características distintivas.

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Introduction

The incidence of infectious spondylodiscitis is rising,^{1–3} which has been attributed to improved access to magnetic resonance imaging (MRI) and, above all, the aging population. In older people, however, the diagnosis of infectious spondylodiscitis proves difficult, and it is often made with delay. In this age group, rachialgia has been shown to be common, primarily caused by degenerative disease, osteoporosis-related complications, metastases, or microcrystalline diseases. Of note is that, in older people, the expression of the infectious syndrome often appears attenuated. Several specific features have so far been underlined, such as a greater incidence of Gram-negative bacilli infection, though this is still controversial.^{4,9} On the other hand, spontaneous infectious spondylodiscitis has not been extensively investigated in older people, with only small series available involving patients over 60 or 65 years old.^{4–12}

This retrospective study thus sought to assess the characteristics of spontaneous infectious spondylodiscitis in patients over 75 years old, comparing them to younger spondylodiscitis patients from the same rheumatology department.

Methods

This study was a retrospective, monocentric analysis as based on the medical records of patients hospitalized for infectious spondylodiscitis in the Clermont-Ferrand university hospital's rheumatology department between 2000 and 2015. Patients suffering from postoperative infections were excluded from participation. Diagnosis was established based on: (1) a specialized musculoskeletal radiologist determining the images, notably the MRI, to be evocative of infectious spondylodiscitis, along with supporting clinical and biological findings; (2) antibiotherapy administered for at least 6 weeks or until death; (3) evolution while on antibiotics indicative of infectious spondylodiscitis.

Patients were considered to have microbiologically-confirmed spondylodiscitis when blood cultures or disco-vertebral biopsy results were positive. For coagulase-negative staphylococcus (CoNS) the infection was considered certain if the same CoNS species was isolated from at least two different samples taken at different times and considered probable if only one sample proved positive.

The data collected from the patients' medical records were as follows: demographic characteristics, localization of the infection, type of microorganism and identification method, initial clinical characteristics, risk factors including presence of cancer during treatment, immunosuppressive treatment, ongoing

corticosteroid therapy, diabetes, renal failure with creatinine clearance < 30 mL/min or dialysis, substance addiction, severe liver failure, infection portal of entry (if identified), and initial biological work-up data. X-rays were defined as indicative of spondylodiscitis when revealing demineralization along with vertebral endplate erosions.

Statistics

Statistical analysis was performed using Stata software (version 13 StataCorp, College Station, US). The tests were two-sided, with a type I error set at $\alpha=0.05$. Continuous data were presented as mean \pm standard deviation (SD) or median [interquartile range] in view of statistical distribution (assumption of normality assessed using the Shapiro–Wilk test). Comparisons between age, categorized according to statistical distribution and clinical relevance into three groups (< 60 years-old, 60–74 years-old and ≥ 75 years-old) or two groups (< 75 years-old and ≥ 75 years-old) were performed using anova or Kruskal–Wallis (KW) test when assumptions of anova were not met ((i) normality, and (ii) homoscedasticity studied by Bartlett test) for quantitative parameters. When appropriate (*omnibus* p -value < 0.05), *post hoc* test for multiple comparisons was applied to take into account inflate of type I error: Tukey–Kramer test post anova and Dunn after KW. For categorical data, Chi-squared or Fisher's exact test was applied, following when necessary by Marascuilo procedure.

Results

From 2000 to 2015, 152 patients were admitted in our rheumatology department for primary spondylodiscitis, 51 (33.6%) aged 75 years or older, 59 between 61 and 74, and 42 aged 60 or younger.

The predominance of male gender (67%) was similar across the age groups. As expected, the over 75-year-olds were more often institutionalized (7.8% vs. 0; $p=0.02$) (Table 1). Infection risk factors were less commonly encountered in the over 75-year-olds (27.5% vs. 54.5%; $p=0.002$), yet incidence of diabetes and cancer did not differ across the groups. Time from first symptoms manifesting to diagnosis increased with age, being shorter for the under 60-year-olds than the 60–74-year-olds and over 75-year-olds (23 [7; 50] vs. 30 [15; 70] vs. 30 [15; 70] days; $p < 0.05$). No difference was observed across the age groups for nonsteroidal anti-inflammatory drug (NSAID) use or antibiotic prescription prior to hospitalization, nor for either spondylodiscitis localization or frequency of neurological symptoms or fever. Frequency and intensity of inflammatory syndrome and leukocytosis were comparable across the different age groups. Initial X-rays indicated spondylodiscitis in nearly half

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