ABSTRACT

Objective: To describe the epidemiology and mortality of thoracolumbosacral arthrodesis surgery in Brazil in the last 10 years.

Methods: Study conducted using data from the SIH of the Unified Health System (SUS) covering the time period from 2008 to 2018 for all regions of Brazil. The data obtained were analyzed using the BioStat 5.3 program, using Chi-square statistical tests, observing a p-value < 0.05 and a 95% confidence interval. Results: A total of 66,631 anterior or posterior approach TLS surgeries were registered. The overall mortality rate was 9.37 deaths per thousand procedures. There are regions with mortality much higher than the national average. The mortality rate increases proportionally with the number of levels involved in posterior arthrodesis. Conclusions: The study of the epidemiological profile of thoracolumbosacral arthrodesis is important, especially in a country whose population is heterogeneous but has different mortality rates among regions. Therefore, it is necessary to create measures that identify and prevent the factors that lead to the death of patients undergoing such a procedure. Level of evidence II; Retrospective, analytical, quantitative and descriptive study.

Keywords: Arthrodesis; Spine/surgery; Epidemiology.

RESUMO

Objetivo: Descrever a epidemiologia e a mortalidade da cirurgia de artrodese toraco-lombo-sacra no Brasil nos últimos 10 anos. 

Métodos: Estudo realizado a partir do SIH do Sistema Único de Saúde (SUS), abrangendo uma série temporal de 2008 até 2018, de todas as regiões do Brasil. Os dados obtidos foram analisados com o programa BioStat 5.3, através de testes estatísticos Qui-quadrado, observando o valor de p < 0,05 e o intervalo de confiança de 95%. Resultados: Foram registradas 66.631 cirurgias com abordagem TLS por via anterior ou posterior. A razão de mortalidade geral foi de 9,37 óbitos por mil procedimentos. Há regiões com mortalidade muito superior que a média nacional. A taxa de mortalidade aumenta proporcionalmente com o número de níveis envolvidos na artrodese posterior. Conclusões: O estudo do perfil epidemiológico da artrodese toraco-lombo-sacra mostra-se importante, sobretudo em um país cuja população é heterogênea e possui diferentes taxas de mortalidade entre as regiões. Portanto, torna-se necessária a criação de medidas que identifiquem e previnham os fatores que levam os pacientes submetidos a tal procedimento ao óbito. Nível de evidência II; Estudo analítico, retrospectivo, quantitativo e descritivo.

Descritores: Artrodese; Coluna Vertebral/cirurgia; Epidemiologia.

RESUMEN

Objetivo: Describir la epidemiología y la mortalidad de la cirugía de artrodésis toraco-lombo-sacro en Brasil en los últimos 10 años.

Métodos: Estudio realizado a partir del SIH del Sistema Único de Salud (SUS), abarcando una serie temporal de 2008 a 2018, de todas las regiones de Brasil. Los datos obtenidos fueron analizados con el programa BioStat 5.3, a través de test estadísticos de Chi-cuadrado, observando el valor de p < 0,05 y el intervalo de confianza de 95%. Resultados: Fueron registradas 66.631 cirugías de abordaje TLS por vía anterior o posterior. La razón de mortalidad general fue de 9,37 decesos por mil procedimientos. Hay regiones con mortalidad muy superior al promedio nacional. La tasa de mortalidad aumenta proporcionalmente con el número de niveles involucrados en la artrodésis posterior. Conclusiones: El estudio del perfil epidemiológico de la artrodésis toraco-lombo-sacro es importante, especialmente en un país cuya población es heterogénea y posee diferentes tasas de mortalidad entre las regiones. Por lo tanto, es necesario crear medidas que identifiquen y prevengan los factores que llevan a los pacientes sometidos a tal procedimiento al deceso. Nivel de evidencia II; Estudio analítico, retrospectivo, cuantitativo y descritivo.

Descriptores: Artrodésis; Columna Vertebral/cirugía; Epidemiología.
INTRODUCTION
In recent years, surgical procedures involving spinal fixation have evolved, beginning in the lumbar region and, later, in the thoracic spine, enabling the correction of various traumatic, oncological, and degenerative diseases, as well as the correction of deformities like scoliosis.

Scoliosis is characterized as an abnormal condition of the lateral curvature of the spine that affects on average 3% of the population. It is classified into different types, including congenital, neuromuscular, and idiopathic, which corresponds to 65% of the cases. Traumatic injuries to the spine and spinal cord can be defined as any injury to a spinal segment with or without involvement of the spinal cord and/or the nerve roots, reaching annual worldwide rates of 50 cases per million individuals and incurring costs of $300 million per year.7-9

RESULTS
Between 2008 and 2018, 66,631 anterior or posterior approach TLS surgeries were recorded. When stratified by the macroregions of Brazil, the South accounted for 34.4% (n=22,921), followed by the Southeast with 34.3% (n=22,846). The North was in fifth place, contributing 2,207 cases, which correspond to 3.3% of the universe studied. (Table 1)

Six hundred and twenty-four deaths were recorded during the period studied, corresponding to 0.93% of all the researched procedures. (Table 2)

The data obtained were analyzed using the BioStat 5.3 program by means of the chi-square test, with a p-value < 0.05 and a confidence interval of 95%. It was not necessary to submit this study to the Institutional Review Board because the data in question was accessed on a public domain database.
Table 3. Mortality ratio between 2008 and 2018 according to type of thoracolumbosacral arthrodesis (anterior or posterior approach) and their levels by macroregion. Belém, Pará, Brazil, 2019.

| Arthrodesis | Level | M | S | M SE | M CW | M NE | M N | Total* |
|------------|-------|---|---|------|------|------|------|--------|
| Anterior approach | I | 13.16 | 12.70 | 11.36 | 9.40 | 0.00 | 11.47 | 1.52 | 4.92 | 0.61 | 8.30 | 10.05 | 3.33 |
| | II | 2.57 | 8.32 | 1.67 | 3.22 | 3.62 | 4.25 | 14.50 | 20.70 | 8.97 | 8.54 | 9.93 | 15.37 |
| | III | 7.97 | 10.14 | 7.16 | 6.80 | 14.17 | 8.54 | 54.74 | 29.33 | 0.00 | 4.98 | 0.00 | 31.12 |
| | IV | 15.87 | 16.64 | 8.32 | 7.23 | 2.89 | 13.65 | 37.72 | 23.85 | 4.40 | 17.62 | 20.41 | 22.12 |
| | V | 14.50 | 20.70 | 8.97 | 8.54 | 9.93 | 15.37 | 39.87 | 12.47 | 4.67 | 6.29 | 8.16 | 9.37 |
| Posterior approach | I | 13.33 | 12.70 | 11.36 | 9.40 | 0.00 | 11.47 |
| | II | 2.57 | 8.32 | 1.67 | 3.22 | 3.62 | 4.25 |
| | III | 7.97 | 10.14 | 7.16 | 6.80 | 14.17 | 8.54 |
| | IV | 15.87 | 16.64 | 8.32 | 7.23 | 2.89 | 13.65 |
| | V | 14.50 | 20.70 | 8.97 | 8.54 | 9.93 | 15.37 |
| | VI | 54.74 | 29.33 | 0.00 | 4.98 | 0.00 | 31.12 |
| | VII | 37.72 | 23.85 | 4.40 | 17.62 | 20.41 | 22.12 |

M: Mortality; S: South; SE: Southeast; CW: Central-West; NE: Northeast; N: North. *p<0.05 (Test=175.5712; p<0.0001), Confidence interval 95%.

**CONCLUSION**

The study of the epidemiological profile of thoracolumbosacral arthrodesis is important, especially in a country whose population is heterogeneous and has different mortality rates between region. Thus, it is necessary to create measures that identify and prevent the factors that lead to the death of patients undergoing such procedures. All authors declare no potential conflict of interest related to this article.