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Lumbar disc surgery: is it only a sentinel event of spinal disease?

BACKGROUND

Lumbar disc-related disorders are a major cause of work-related osteo-articular morbidity. Lumbar disc surgery (LDS) was chosen as the sentinel event to implement a system for the epidemiological surveillance of these disorders. The aim of this study was to describe the variations in the incidence of LDS and the influence of socioeconomic factors and of factors related to healthcare provision on this incidence.

METHODS

LDS was identified in the hospital database of the Pays-de-la-Loire region. A total of 16,267 LDS cases was detected from 7 codes for surgical acts between 2007 and 2010. The mean annual incidence rates of LDS were calculated by considering the French National Institute of Statistics and Economic Studies (INSEE) census of 2008 for each of the 137 regional areas (RAs) in the region. In order to determine classes of RAs, a main component analysis, followed by a hierarchical bottom-up classification, was carried out on the basis of socioeconomic factors (1) and of factors related to healthcare provision (2):

1. proportions of the population aged 60 and over and 25 to 59, median income per unit of consumption, unemployment and employment rates, precarious employment rate, proportions of professionals, technicians, associate professionals and blue-collar workers, proportions of employment in construction and agriculture;
2. Local Potential Accessibilities (LPA) to general practitioners (GPs) and physiotherapists, density of rheumatologists, travel time to the nearest center for spinal surgery, hospitalization rates in surgery and medicine services.

RESULTS

The mean incidence rate of LDS was 1.6‰ (standard deviation = 0.3) and varied widely according to RA. There were three types of RA (table and figure).

The **first category of RAs** (in gray in the figure) encompassed the **large regional cities and coastal RAs**, with a rich supply of healthcare, a high proportion of managers and higher intellectual professions, but also a higher unemployment rate, coupled with a high incidence of LDS.

The **RAs located around the large cities** constituted the **second category** (in orange in the figure), with a smaller proportion of people over 60, and higher employment rates, associated with a low incidence of LDS.

The **third category** (in green in the figure) included the **RAs located at the periphery of the administrative limits of the 5 departments of the region**. It was marked by a weak supply of healthcare and a higher proportion of manual workers and agriculture and was associated with an intermediate impact of LDS.

Figure 1 Representation of the mean annual incidence rates of lumbar disc surgery (in tertiles) and of the classification of regional areas carried out on the basis of socioeconomic factors and of factors related to healthcare provision, Pays-de-la-Loire region

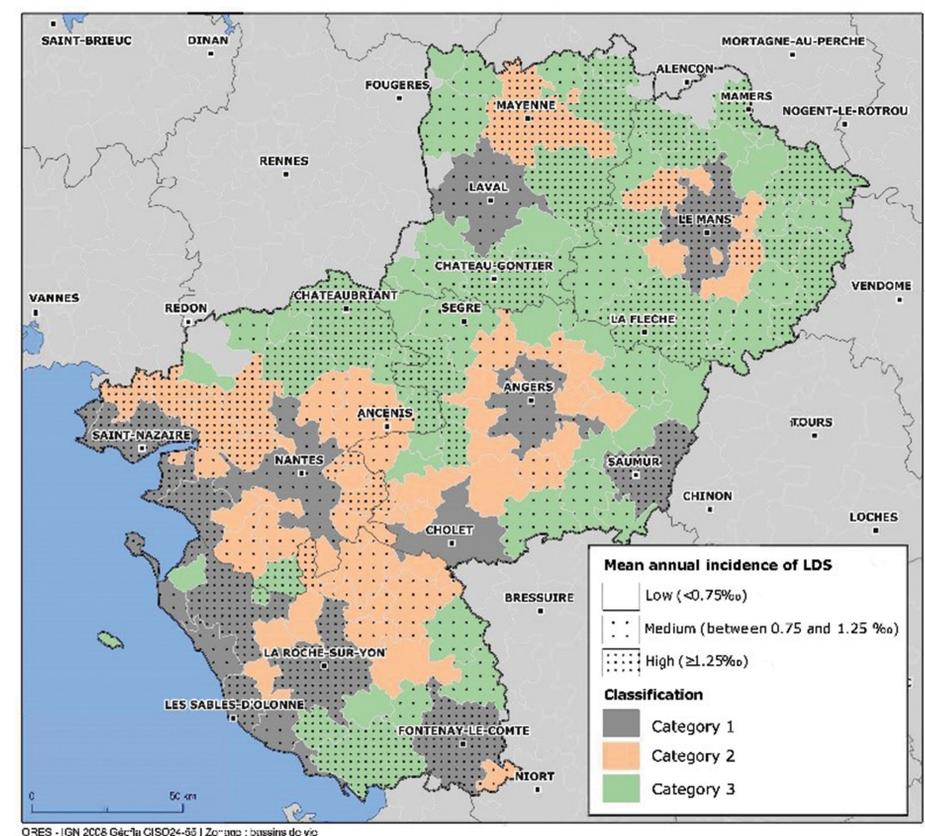


Table 1 Description of classes of regional areas according to the annual incidence of lumbar disc surgery, socioeconomic factors and of factors related to healthcare provision

	Category 1 (n=20)	Category 2 (n=53)	Category 3 (n=64)	p-value*
Total population (French census of 2008)	42,625	11,088	8,032	<0.0001
Annual incidence of lumbar disc surgery (for 1,000 inhabitants)	1.3	0.8	1.1	0.0002
Proportion of population aged 60+ (in %)	27.1	18.6	25.8	<0.0001
Proportion of population aged 25-59 (in %)	44.3	48.4	44.6	<0.0001
Median income per unit of consumption (in € per year)	18,436	17,616	16,066	<0.0001
Unemployment rate in population aged 15-64 (in %)	11.0	6.4	8.9	<0.0001
Employment rate in population aged 15-64 (in %)	61.7	71.8	68.3	<0.0001
Precarious employment rate (in %)	13.9	12.7	13.5	0.0017
Proportion of professionals and technicians, associate professionals (in %)	10.0	8.9	5.9	<0.0001
Proportion of blue-collar workers (in %)	26.3	31.3	36.5	<0.0001
Proportion of employments in construction (in %)	8.7	10.2	9.6	0.2417
Proportion of employments in agriculture (in %)	3.9	8.2	12.5	<0.0001
LPA to private general practitioners (in full-time number for 100,000 inhabitants)	73.8	61.7	58.1	<0.0001
LPA to private physiotherapists (in full-time number for 100,000 inhabitants)	65.3	54.6	30.0	<0.0001
Density of rheumatologists (for 100,000 inhabitants)	2.0	0	0	<0.0001
Hospitalization rates in surgery services (for 1,000 inhabitants)	107.7	69.2	84.2	<0.0001
Hospitalization rates in medicine services (for 1,000 inhabitants)	122.4	59.7	100.4	<0.0001
Travel time to the nearest center for spinal surgery (in minutes)	31.5	27.3	38.0	<0.0001

* Kruskal-Wallis test

DISCUSSION/CONCLUSION

This study suggests a link between the incidence of LDS and criteria other than strictly medical. Thus, the LDS indicator may be a health tracer that may also reflect the provision of healthcare and the socio-economic fabric that could be useful for the implementation of policies to tackle social and territorial health inequalities.