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Profile of Degenerative Spine Diseases at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Denpasar in 2022-2023

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ABSTRACT

Background: Degenerative spine disease is a chronic condition with an increasing prevalence as age and life expectancy. There are approximately 266 million cases annually, with the highest incidence reported in Southeast Asia. In Indonesia, there is a lack of specific data on this disease. The Basic Health Research (Riskesdas) in 2018 only reported data on joint diseases in individuals aged ≥15 years, while the Ministry of Health Center for Data and Information (Pusdatin)'s publication in 2016 focused solely on osteoporosis. This study, conducted at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Denpasar, aims to determine the profile of degenerative spine disease at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Denpasar in 2022–2023 based on age, sex, BMI, occupation, and pathoanatomical location.

Methods: This descriptive study included 164 samples collected from the Medical Records Department of Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Denpasar over six months in 2024.

Results: Among 164 medical records meeting the inclusion criteria, 55.5% of patients were classified as old age (65–90 years), and 50.6% were male. Approximately 29.3% of patients had obesity (BMI 25.0–29.9) and a normal BMI (18.5–22.9). Regarding occupation, 61% of patients had sedentary jobs, and 87.2% had degenerative spine disease primarily in the lumbar region.

Conclusion: Most patients with degenerative spine disease were old age, predominantly male, with obesity and a normal BMI, engaged in sedentary occupations, and predominantly affected in the lumbar region.

Keywords: Profile, degenerative spine disease, degenerative disease

INTRODUCTION

Degenerative spine disease is a chronic condition characterized by the progressive deterioration of the spinal structure over time. It has garnered significant attention due to its global burden and substantial impact on patients' quality of life. The prevalence of degenerative spine disease increases with aging. Rising life expectancy has contributed to a higher incidence of this condition.

Globally, the annual incidence of degenerative spine disease is estimated at 266 million cases, with a prevalence of

27.3% that increases with age.[1,2] Southeast Asia accounts for the highest regional burden, with 69 million cases annually.[1] However, in Indonesia, specific data on degenerative spine disease remain unavailable. National reports such as the 2018 Basic Health Research (Riskesdas) and publications by the Ministry of Health's Data and Information Center (Pusdatin) lack focused discussions on this condition, further highlighting the need for comprehensive studies.[3,4]

The prevalence and incidence of degenerative spine disease are notably high, with evidence suggesting a greater occurrence in women compared to men. According to Parenteau et al., the annual prevalence in women (34.7±1.9%) significantly exceeds that in men (18.1 ± 1.8%).[2] This gender disparity underscores the necessity of addressing degenerative spine disease as a priority health issue.

Despite the significant burden, degenerative spine disease can be mitigated through preventive measures, including improved dissemination of information. Currently, Indonesia lacks of adequate data to guide public health interventions. For instance, the Riskesdas only provides data on general joint diseases, while Pusdatin publications primarily focus on osteoporosis, a condition related to, but not exclusive to the spine.[3,4]

Given these gaps, a study to determine the profile of degenerative spine disease at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Denpasar in 2022–2023 is expected to contribute valuable insights. Findings from this research may report the progression of degenerative spine disease in Bali, facilitating better awareness and targeted strategies to address this growing public health concern.

LITERATURE REVIEW

Degenerative spine disease is a chronic condition resulting from the progressive deterioration in the structure and function of the spine, involving the discs, joints, and vertebrae, typically associated with aging.[5,6] This degeneration is characterized by increased production of degradative mediators, such as matrix metalloproteinases (MMPs), interleukin-1 (IL-1), tumor necrosis factor-alpha (TNF-α), superoxide, and nitric oxide, alongside a reduction in tissue inhibitors of metalloproteinases (TIMP), proteoglycans, linking proteins, and type IX collagen. Additionally, a shift from type II to type I collagen compromises the nucleus pulposus, rendering it solid, dry, and granular.[7] Aging intervertebral disc cells also lose their proliferative capacity, leading to increased catabolism and reduced anabolism.[8]

Clinically, degenerative spine disease presents with symptoms such as paresis, paresthesia, radicular pain, discogenic pain, and facet joint pain.[9,10] It predominantly affects the cervical and lumbar regions and is a leading cause of global disability, contributing to low back pain and neck pain.[11] Common degenerative spine conditions include cervical spondylotic myelopathy, ossification of the posterior longitudinal ligament, lumbar osteoarthritis, lumbar disc herniation, spondylolisthesis, and lumbar spinal canal stenosis.[9]

MATERIALS & METHODS

Data were collected from the Medical Records Department of Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Denpasar over six months in 2024, starting from January to June. This study received approval from Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Denpasar and ethical clearance from the Ethics Committee of the Faculty of Medicine, Udayana University, Denpasar, Indonesia.

This study is a descriptive research design using secondary data obtained from the medical records of Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Denpasar. The study employed total sampling, resulting in 164 samples. The inclusion criteria are patients diagnosed with degenerative spine disease treated at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Denpasar in 2022–2023, while the

exclusion criteria excluded patients with a history of trauma or injury.

STATISTICAL ANALYSIS

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) and Microsoft Excel 2019. The results are presented in tables (frequency and percentage) and narratives, highlighting risk factors and the pathoanatomical locations of degenerative spine disease.

RESULT

Based on 266 medical records retrieved from the Medical Records Department of Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Denpasar in 2022–2023, 164 records met the inclusion and exclusion criteria.

Table 1. Profile of Degenerative Spine Diseases at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Denpasar in 2022-2023

Characteristic	Frequency (n=164)	Percentage (%)
Age (Years)		
Young Age (18-35)	15	9.1
Middle Age (36-55)	58	35.4
Old Age (56-90)	91	55.5
Sex		
Male	83	50.6
Female	81	49.4
Body Mass Index		
Underweight (BMI<18.5)	4	2.4
Normal (BMI 18.5-22.9)	48	29.3
Overweight (BMI 23.0-24.9)	42	25.6
Obesity I (BMI 25.0-29.9)	48	29.3
Obesity II (BMI≥30.0)	22	13.4
Occupation		
Sedentary	100	61
Active	64	39
Pathoanatomical Location		
Cervical	14	8.5
Lumbar	142	86.6
Cervical and Lumbar	8	4.9

According to Table 1, of the 164 patients, 15 patients (9.1%) were categorized as young age (18–35 years), 58 patients (35.4%) as middle age (36–55 years), and 91 patients (55.5%) as old age (56–90 years). Regarding sex distribution, 83 patients (50.6%) were male, and 81 patients (49.4%) were female. Table 2 shows that among young age patients, there were 9 males (5.48%) and 6 females (3.65%). In the middle age group, there were 28 males (17.07%) and 30 females (18.29%). In the old age group, there were 46 males (28.04%) and 45 females (27.43%).

Table 2. Proportion of Degenerative Spine Diseases at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Denpasar in 2022-2023 According to Age and Sex Distribution

Age (Years)	Sex		Total
	Male	Female	
Young Age (18-35)	9 (5.48%)	6 (3.65%)	15 (9.1%)
Middle Age (36-55)	28 (17.07%)	30 (18.29%)	58 (35.4%)
Old Age (56-90)	46 (28.04%)	45 (27.43%)	91 (55.5%)
Total	83 (50.06%)	81 (49.4%)	164 (100%)

Table 1 also indicates that 4 patients (2.4%) were underweight, 48 patients (29.3%) had normal weight, 42 patients (25.6%) were overweight, 48 patients (29.3%) had obesity

class I, and 22 patients (13.4%) had obesity class II. A total of 100 patients (61%) had sedentary occupations, while 64 patients (39%) had active jobs. Regarding the pathoanatomical location of degenerative spine disease, 14 patients (8.5%) had cervical involvement, 142 patients (86.6%) had lumbar involvement, and 8 patients (4.9%) had degenerative spine disease affecting both the cervical and lumbar regions.

DISCUSSION

In this study, degenerative spine disease at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Denpasar in 2022–2023 was predominantly observed in the old age group (65–90 years), accounting for 91 patients (55.5%). This aligns with previous studies, which found that the highest incidence of degenerative spine disease occurs in the old age group (56–90 years), followed by the middle age group (36–55 years) and the young age group (18–35 years).[12] The findings also align with earlier research indicating that the prevalence of degenerative spine disease increases with age.[13]

The study revealed that males were slightly more affected than females, with 83 patients (50.6%) and 81 patients (49.4%), respectively. Table 2 shows that young males (5.48%) had a higher tendency to develop degenerative spine disease compared to young females (3.65%). This is consistent with previous research suggesting that young men are more prone to degenerative spine disease due to mechanical stress associated with occupational risk factors.[14] Conversely, middle-aged females (18.29%) were slightly more affected than middle-aged males (17.07%), which aligns with studies indicating that hormonal changes during aging make women more susceptible to degenerative spine disease.[2]

Regarding body mass index (BMI), 48 patients (29.3%) were classified as having obesity class I (BMI 25.0–29.9), and 48 patients (29.3%) had a normal BMI (BMI <18.5). This is in line with previous studies suggesting that individuals with higher BMI are at greater risk of developing degenerative spine disease compared to those with normal or lower BMI.[15,16] A recent cohort study of 44 monozygotic male twin pairs found no causal relationship between higher BMI and intervertebral disc degeneration.[17]

Occupational data indicated that 100 patients (61%) had sedentary jobs, supported by prior research showing that low physical activity increases the risk of intervertebral disc height narrowing and high-intensity pain or disability.[18] However, a cross-sectional study of key industrial workers in China suggested that activities such as lifting heavy loads (over 20 kg), repetitive movements, prolonged static postures, and frequent overtime work are also risk factors for low back pain.[19]

Based on medical records, the lumbar region was the most commonly affected anatomical site of degenerative spine disease, observed in 142 patients (86.6%). The cervical region accounted for 14 patients (8.5%), while both regions (cervical and lumbar) were affected in 8 patients (4.9%). Previous studies reported that degenerative spine disease in the lumbar region predominantly affects the L4/5 vertebrae, with 69.1% of male and 75.8% of female cases. In contrast, the most affected cervical vertebrae are C5/6, with incidences of 51.5% in males and 46% in females.[20] However, a retrospective radiological study found no significant differences between degenerative spine disease in the cervical and lumbar regions.[21]

CONCLUSION

Based on the study results, the profile of degenerative spine disease at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Denpasar in 2022–2023 are predominantly older age, males, individuals with obesity class I and normal weight, those engaged in sedentary occupations, and cases most commonly affecting the lumbar region.

Future studies could use medical records over a longer period to obtain a more representative sample. Additionally, further research could provide a more detailed operational definition of occupation, beyond the simple classification of sedentary and active work.

Declaration by Authors

Ethical Approval: Ethical approval of the Research Ethics Commission of the Faculty of Medicine, Udayana University, Denpasar, Indonesia (Ethical Clearance No: 0325/UN14.2.2.VII.14/LT/2024).

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