Herniated Nucleus Pulposus in Dr. Hasan Sadikin General Hospital Bandung Indonesia

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Abstract

Background: Herniated nucleus pulposus (HNP) is one of the most common diseases of the spine. For an optimal management and prevention, there's a need for data on factors related to the onset of complaints because this disease lowers the quality of life and increases morbidity. This study is aimed to see the scale and pattern of the HNP in Dr. Hasan Sadikin General Hospital, Bandung.
Methods: This is a descriptive study with the design of case series, data was obtained from medical records of patients with the diagnosis of HNP in the inpatient care of Dr. Hasan Sadikin General Hospital in the period of 2007–2011.
Results: According to the study on 79 patients, with 43 men and 36 women, the highest incidence was at the age group of 51–60 years old (31.6%) and most common occupation was civil servant (11.4%). The most common clinical symptoms were sciatica (51.9%) and low back pain (51.9%). Most frequent location was in the lumbar vertebrae at the level of L5–S1 (58.2%). Trauma was found to be the highest relatable history in the patients (39.2%). Therapy of choice was primarily conservative (58.2%) and most patients went home after the progression (84.8%). The year 2007 showed the highest prevalence of HNP at 25.3%. The most common clinical symptoms were sciatica (51.9%) and low back pain (51.9%)
Conclusions: The most common clinical symptoms were sciatica and low back pain. Most frequent location was in the lumbar vertebrae at the level L5–S1. [**AMJ**.2015;2(1):179–85]

Keywords: Event pattern, herniated nucleus pulposus, prevalence

Introduction

Herniated nucleus pulposus (HNP) is an occurrence of protrusion from the nucleus pulposus through the annulus fibers of intervertebral disc.[1] This disease is one of the most common causes for neural root pain in which the patient complains of low back pain.[2] The prevalence of HNP is about 1–3% in Finland and Italia. In the US, 1–2% of the population are afflicted with HNP.3 Aside from that, the incidence of HNP in some developing countries is about 15–20% of the total population. This disease mainly attacks adults in the age of 30–50 years old and peaks at 40–45 years old.[4,5] The ratio of HNP between men and women is 2:1. Yet, in general populace, the incidence appears to be similarly distributed between men and women.[2] Women tend to complain about low back pain, and radiating pain from the hip to the leg is reported more commonly by men.[5]

The HNP is most commonly found in the lumbar vertebrae, and only a small percentage of it is found in the cervical region. HNP in the thoracic vertebrae is very rare and happens only in 1:1 million patients.[6,7] In individuals of age between 25–55 years old, 95% of HNP occurs in the lumbar vertebrae in the L4–L5 region or L5–S1 while HNP above the L4 vertebrae happens more in individuals aged more than 55 years old.[3,8]

The most common symptoms of HNP is sciatica, which occurs in 40% of HNP patients.[9] In about half of the HNP patients, a form of trauma causes back pain. And yet, an experimental study and statistical analysis of a case did not support the concept that direct trauma or increase of weight on the vertebrae could be the cause of disc rupture, even when the condition worsened the existing degeneration.[2] Risk factors of HNP include smoking, weight training, and work related

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to activity that requires multiple occurrences of heavy lifting. Sedentary lifestyle, frequent driving, and chronic cough are frequently regarded as risk factors. An individual whose occupation requires more than 50% of the time being inside a vehicle (such as drivers) has higher risk to HNP.[5,10]

According to the information above, it was known that there had not been many studies of HNP in Indonesia. The rise of incidence of the disease can lower the quality of life of a person and increase the morbidity. Incidence will keep rising as the Indonesian populaces are increasingly sedentary and the lack of awareness of the disease. As such, there is a need for early detection and prevention on the population at risk and for faster and more accurate therapy on those already afflicted.

This study aims to further research the scale and pattern of HNP in the Department of Orthopaedic and Traumatology of the Dr. Hasan Sadikin General Hospital in the period of 2007–2011.

Methods

This study used a retrospective descriptive method with case serie design on patients of HNP in the Department of Orthopaedic Surgery and Traumatology in Dr. Hasan Sadikin Hospital in the period of 2007–2011. Secondary data were obtained from medical record of the patients whose diagnosis were HNP in the inpatient care of. Dr. Hasan Sadikin General Hospital.

Data collection was done in Dr. Hasan Sadikin General Hospital starting from August to November 2012. Research population was defined as all patients diagnosed with HNP. The Department of Orthopaedic and Traumatology Dr. Hasan Sadikin General Hosptial made this diagnosis in the period of 2007–2011.

Inclusion criteria was every patient diagnosed with HNP and treated in the inpatient care of the Department of Orthopaedic and Traumatology of Dr. Hasan Sadikin General Hospital during 2007–2011. While the exclusion criteria was patients with incomplete medical record data. All patients that met the inclusion criteria had their age, occupation, clinical symptoms, location of abnormality, activity and condition history, therapy, and status at the checkout list.

Data analysis was done using the software of Microsoft Excel and SPSS version 17.0. The data obtained from medical record were then processed and categorized into tables, and had the frequency and percentage of each characteristic calculated.

Result

Within the period of 5 years, during 2007–2011, according to the medical record data,

Table 1 Distribution of Herniated Nucleus Pulposus Patients According to Age and Gender

Characteristics	N (79)	%
Age		
Mean (SD) : 50 (12,89)		
Median (Range) : 51,00(20–77)		
<=20 years old	1	1.3
21–30 years old	6	7.6
31–40 years old	15	19.0
41–50 years old	17	21.5
51–60 years old	25	31.6
61–70 years old	13	16.5
71–80 years old	2	2.5
Gender		
Men	43	54.4
Women	36	45.6

Table 2 Distribution of Herniated Nucleus Pulposus According to Occupation

Occupation	N	%
Civil Servant	9	11.4
Professional	2	2.5
Pensioner	7	8.9
Housewife	8	10.1
Laborer	8	10.1
Employee	2	2.5
Merchant	1	1.3
Builder	2	2.5
Private Worker	3	3.8
No Data	37	46.8
Total	79	100.0

79 HNP patients were in the inpatient care of Department of Orthopaedic and Traumatology Dr. Hasan Sadikin General Hospital (Table 1). Afterward, a discussion of pattern of disease according to age, gender, occupation, clinical symptoms, location of abnormality, history of activity and patient's condition, therapy and status when checking out was required.

The highest incidence was at the age group of 51–60 years old (31.6%). The median age of the patients was 51 years old, ranging from 20–77 years old. The number of men was more than that of women (54.4% to 45.6%).

Table 2 shows that most subjects had no record of work in their medical record with 37 individuals (46.8%). The distribution of patients with HNP was discovered that they mostly worked as a civil servant, with 9 individuals (11.4%).

Table 3 shows that the patients had one or more clinical symptoms. Clinical symptoms most widely shown in patients were low back pain and sciatica, each by 41 individuals (51.9%) and least pain spreading to the shoulders and neck pain, each by 1 individual (1.3%).

Table 3 Distribution of Herniated Nucleus Pulposus Patients According to Clinical Symptom

Clinical Symptoms	Yes		No	
	n	%	n	%
Brachialgia	2	2.5	77	97.5
Radiating pain towards the shoulder	1	1.3	78	98.7
Localized pressure pain	4	5.1	75	94.9
Cervical pain	1	1.3	78	98.7
Pain in Lower Limb	4	5.1	75	94.9
Low Back Pain	41	51.9	38	48.1
Defecation and Urination Disturbance	7	8.9	72	91.1
Paresthesia	18	22.8	61	77.2
Hipoesthesia	23	29.1	56	70.9
Motoric Disturbance	29	36.7	50	63.3
Sciatica	41	51.9	38	48.1

Table 4 Distribution of Herniated Nucleus Pulposus Patients According to Location of Disturbance

Location of Disturbance	Yes		No	
	n	%	n	%
C3–C7	2	2.5	77	97.5
C5–C6	3	3.8	76	96.2
C5–C7	1	1.3	78	98.7
C6–C7	1	1.3	78	98.7
T8–T9	1	1.3	78	98.7
T10–T12	1	1.3	78	98.7
T11–T12	1	1.3	78	98.7
L3–L4	11	13.9	68	86.1
L4–L5	43	54.4	36	45.6
L5–S1	46	58.2	33	41.8
Amount of Location	n		%	
Single	45		57	
Multiple	34		43	
Total	79		100,0	

The most often HNP happened were located on the lumbar vertebrae at L5–S1 by 46 individuals (58.2%) and on the cervical vertebrae at C5–C6 by 3 individuals (3.8%). One located on the thoracic vertebrae was only 1 individual (1.3%). The number of abnormalities in the patient can be single (one location of abnormality) or multiple (more than one location of abnormality). Nevertheless, the most, the patients have one-location disorders, as many as 45 people (57%).

The most common history of activity and patient's condition is trauma with 31 individuals (39.2%), followed by heavy lifting with 19 individuals (24.1%).

The mostly done therapy is the conservative therapy to 26 individuals (58.2%) and the most patient's condition when going home are improvement on 67 individuals (79.0%).

Discussions

Age is one of the most important factors in the case of HNP. According to Malanga[5], incidence of this case is the largest in adults of age 30–50 years old, and peaks at 40–45 years old. On the contrary, according to Moskovich (2006), the prevalence of this case rises at the age of more than 50 years old in the population of the United States of America.[4]

Table 1 showed that from 79 patients of HNP, 43 (54.4%) were men and 36 (45.6%) were female. The incidence peaked at the age group of 51–60 years old, with 25 individuals

Table 5 Distribution of Herniated Nucleus Pulposus Patients According to Activity History and Condition

Activity History and Condition	Yes		No	
	n	%	n	%
Heavy lifting	19	24.1	60	75.9
Trauma	31	39.2	48	60.8
Chronic disease	7	8.9	72	91.1
No data	7	8.9	72	91.1

Table 6 Distribution of Herniated Nucleus Pulposus Patients According to Therapy and Status at Check Out

Therapy	N(79)	%
Conservative	46	58.2
Operative	33	41.8
Status at Check Out		
Improvement	67	84.8
Cured	7	8.9
Not Cured	4	5.1
Dead	1	1.3

(31.6%). This study showed that this disease is less likely to occur at less than 30 years old of age, while that in the increasing age is in concordance with the increasing amount of HNP cases. According to Wong[2], this is because with increasing age, there will be a degeneration of disc and joint facets due to diminishing water content. While in the age group of less than 30 years old, the spring force resilience of the discus protects it from herniation.

According to table 1, more men were afflicted than women. According to Wong (2006), HNP tends to be similarly afflicting to men and women. The incidence is also known to occur more likely on workers who were exposed with heavy work such as grinding or heavy lifting. Men works more in industries requiring heavy work, therefore the incidence of the case is more numerous in men.[2]

Occupation is an important factor on the incidence of HNP. Occupations that carry risk to the occurrence of this case involve heavy work that is defined as a work requiring great physical strength or energy needs. Examples of these are as follows: lifting, twisting, bending, and jobs that can affect the whole body vibration. This kind of job includes workers who spend more than 50% of their work time in the car (eg driver) and workers who use the equipment and the construction industry (eg laborers).[5]

According to Table 2, it can be seen that from most of the 79 patients, those working as civil servants are 9 individuals (11.4%). 37 individuals (46.8%) are of unknown occupation because of the incomplete medical records. Therefore, the risks of the work to the case of HNP cannot deliver significant picture. This study shows that the largest employment is the civil servant. This may be linked to a person's body ergonomic factors at work. It is expected that civil service workers observe good posture while working. However, further research needs to be done about the most influential risk factors for civil servants.

According to Hirsch[11], HNP is one of the most common causes of nerve root pain, which causes the patient to complain of lower back pain that can be accompanied by sciatica.[11] This is consistent with the research that has been done, as suggested in table 3 proving that the patients experienced one or more clinical symptoms. Clinical symptoms most widely shown in patients were low back pain and ischialgia, each with 41 individuals (51.9%).

Hernia on the cervical vertebrae often causes pain in the neck, shoulders, and arms.[12] Based on literature, this disease occurs unilaterally, but it can also occur bilaterally if there is a large central herniated disc pressing some nerve roots at the same level.[13]

According to Skinner[9], the most common clinical symptoms is sciatica, occurring in 40% of patients with HNP. Sciatica is a pain that is felt throughout the radicular leg and the course of nerve ischiadicus and continues to the peripherals.[14] Based on the writings by Maheswari[15], one most common symptoms of HNP is low back pain with or without sciatica. The radiation pattern depends on the root compression pain and body dermatome pattern. Moreover, it can cause neurological symptoms corresponding with the dermatome of the affected nerve. In the case of a large herniated disc pressing some nerve roots, the patient will experience paralysis of the lower limbs, hypoesthesia on dermatomes L5–S4, and disturbance of urination and defecation.

According to table 4, it can be seen that patients had one or more locations of abnormality. However, the most numerous

of them, patients who had a single location, amount to 45 individuals (57%). In contrast, patients with multiple locations amount to 34 individuals (43%). From the location on the level of cervical vertebrae, the most numerous were at the level of C5–C6, which amounts to 3 individuals (3.8%). In the level of thoracic vertebrae, there was a spreading out numerosity, while in the lumbar vertebrae level, the most numerous was in the L5–S1 that amounts to 46 individuals (58.2%). But as a whole, from a total of 79 patients, the most numerous location was in the lumbar vertebrae at L5–S1 which amounts to 6 individuals (58.2%) and the second most numerous was at the level L4–L5 at 43 individuals (54.4%).

This is because the lumbar vertebrae supports most of the weight force of the body compared to other vertebrae, has the highest pressure, and thinner annulus fibrous fibers in the posterior of the disc. In lumbar vertebrae, posterior longitudinal ligaments are stronger medially and laterally only contain a little fibers. Lateral posterior longitudinal ligaments would be the weakest part and prone to herniation.[2]

This result is in accordance with the report written by Jordan et al.[3], that about 95% of HNP occur in lower lumbar vertebrae such as L4–L5 and L5–S1, and the incidence is smaller in the cervical region.

The process of the occurrence of HNP pathology starts because of a degeneration in the nucleus pulposus. According to Wong[2], approximately half of the patients of HNP experiencing the back pain symptom is due to various forms of trauma.

Activity history and the condition that induced the symptoms of degenerative disease were obtained from the medical records of history taking of the patients. The history is like trauma, such as heavy lifting occupation, and chronic diseases such as chronic cough, prostate hypertension, and osteoporosis. According to table 5, the data showed that the most common history of activity and patient's condition is trauma by 31 individuals (39.2%), followed by heavy lifting with 19 individuals (24.1%). In this research, the type of trauma was not known and such for a better prevention, a more complete study is needed.

The standard procedure of HNP therapy can be divided into conservative and operative therapy. Operative therapy is mostly done when the conservative therapy does not show a satisfying result, continuous pain, and neurological disturbance. Table 6 showed that the mostly done therapy is the conservative therapy to 26 individuals (58.2%). According to the study conducted by Marquardt[8], 75% of the HNP case will spontaneously be cured in 6 months and only 19% requires operative intervention.

According to Benjamin and Zieve[6], the majority of HNP patients will improve without medication, but a small minority will complain of back pain even after the medication. This can take months or even years to return to normal activity without pain in the vertebrae region. According to table 6, the data showed that the status of patient when checking out is in improvement, by 67 individuals (84.4%). This improvement can be clinically assessed such as the pain, sensory disturbance, and motoric disturbance that all are receding.

According to this study, it can be concluded that the case of HNP mostly afflicts individuals within the age of 51–60 years old, men, working as civil servant, and has history of trauma. The distribution in regard of age, gender, clinical symptoms and location of disturbance is similar to other studies. Nevertheless, it is hoped that further research would be done using analytic study to see other factors that influence the case of HNP. Other than that, it is hoped that healthcare institutions can give counseling to public about HNP so that the people can know the signs and symptoms of this disease.

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