

# Pressure ulcer rates of stroke patients in a public rehabilitation hospital and training rates of nurses for pressure ulcer

## Bir kamu rehabilitasyon hastanesindeki inme vakalarının bası yarası oranları ve hemşirelerin bası yarası eğitim oranları

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### Abstract

**Aim:** Stroke is a brain vascular disease that affects millions of people in the world every year and causes disability. Complications following a stroke are known to increase hospital stay and patient care costs. A complication of stroke, pressure ulcer, can be avoided with education of the caregiver. That is why we aimed to investigate the rates of pressure ulcers of patients who were hospitalized in a public rehabilitation hospital because of stroke. Secondary aim of this study is to investigate the in-service trainings of the nurses about pressure ulcers.

**Methods:** This is an observational study. The files of inpatient stroke cases were retrospectively analyzed for dates between 01/01/2016 and 12/31/2018 and the data were collected. Education service files are analyzed for in-service trainings about pressure ulcers. Percentages were calculated for statistical analysis.

**Results:** Of the 3640 patients hospitalized in our hospital, 1776 had stroke (48.80%). The number of patients with acute stroke was 1216 (68.47%). The mean number of days of hospitalization was 27.6 days. When the demographic characteristics of the patients were examined, 1005 of the inpatients were male (56.59%), 771 were female (43.41%). The mean age of the male patients was 64.18 and the mean age of the female patients was 68.78 respectively. When the risk factors for stroke were examined, 59.74% of the hospitalized patients had hypertension (HT), 25.16% had diabetes mellitus (DM), 13.56% had hyperlipidemia (HL), 15.03% had cardiac disease, 6.41% had urinary infection, 3.71% had pulmonary infection, 0.5% had deep vein thrombosis, and 0.56% had malignancy. When the rate of pressure ulcers were examined, the number of stroke patients with pressure ulcers was 123 (6.92%) and no new pressure ulcers were observed during hospitalization. The rate of stroke patients with pressure ulcers among all pressure ulcer patients was calculated as 32.97%. The most common anatomic localization was sacrum 65 (52.84%) while the least common localization was elbow region with 1 patient (0.81%). The in-service trainings given to the nurses for pressure ulcers were 2 per year and the rate of nurses attending the training was determined as 71.5%. The number of trainings for medical companions was 12 per year and the participation rate to the training was 57.3%.

**Conclusion:** The incidence of pressure ulcers in stroke patients was determined as 6.92% and the most frequent localization was sacrum. The fact that the rate of new pressure ulcer opened in the hospital is zero indicates that in-service training and awareness about pressure ulcers in the rehabilitation hospital is sufficient.

**Keywords:** Stroke, Pressure ulcer, Rehabilitation

### Öz

**Amaç:** İnme, her yıl dünyadaki milyonlarca insanı etkileyen ve yeti yitimine neden olan bir beyin damar hastalığıdır. İnme sonrası komplikasyonların hastanede kalmayı ve hasta bakım maliyetlerini arttırdığı bilinmektedir. İnme komplikasyonlarından biri olan bası yaraları bakım verenin eğitimi ile önlenir. Bu çalışmanın amacı bir kamu rehabilitasyon hastanesinde inme nedeniyle yatarak rehabilitasyon gören hastaların bası yarası oranlarını ve hemşirelere yönelik verilen bası yarası eğitim oranlarını araştırmaktır.

**Yöntemler:** Çalışmamız gözlemsel bir çalışmadır. 3 yıl boyunca (01.01.2016-31.12.2018), hastanemizde yatarak inme tedavisi gören hastaların dosyaları retrospektif olarak taranarak veriler toplanmıştır. Hemşire eğitimleri için eğitim birim kayıtları kullanılmıştır. İstatistiksel analiz olarak yüzde hesaplamaları kullanılmıştır.

**Bulgular:** Hastanemizde yatan toplam 3640 hastanın 1776'sı inme (%48,80) olarak saptanmıştır. Yatan akut inmeli hasta sayısı 1216 (%68,47) olarak bulunmuştur. Hastaların yattığı ortalama gün sayısı ise 27,6 gün olarak saptanmıştır. Hastaların demografik özelliklerine bakıldığında yatan hastaların 1005'i erkek (%56,59), 771'i kadın (%43,41) olup cinsiyete göre yaş ortalamasına bakıldığında erkek hastaların yaş ortalaması 64,18 olarak saptanırken kadın hastaların yaş ortalaması 68,78 olarak saptanmıştır. İnme risk faktörlerine bakıldığında hastanemizde yatan hastaların %59,74'ünde hipertansiyon (HT), %25,16'sında diyabetes mellitus (DM), %13,56'sında hiperlipidemi (HL), %15,03'ünde ise kardiyak hastalık, %6,41'inde üriner enfeksiyon, %3,71'inde pulmoner enfeksiyon, %0,5'inde derin ven trombozu, %0,56'sında ise malignite mevcuttur. Yatış esnasında bası yarası olan inmeli hasta sayısına bakıldığında 123 (%6,92) olarak tespit edilmiş olup, yatış sırasında yeni oluşan bir bası yarasına rastlanmamıştır. İnme tanısı almış bası yaralı hastaların hastanede yatan toplam bası yarası olan hasta sayısına oranına bakıldığında %32,97 olarak bulunmuştur. Bası yarasına en sık rastlanan anatomik lokalizasyon sakrum 65 (%52,84) olurken, en az rastlanan lokalizasyon ise 1 hasta (%0,81) ile dirsek bölgesi olmuştur. Hemşirelere verilen bası yarası eğitimleri yılda 2 adet olup eğitime katılan hemşire oranı %71,5 olarak saptanmıştır. Refakatçilere verilen bası yarası eğitim sayısı yılda 12 adet olup eğitime katılım oranı %57,3 olmuştur.

**Sonuç:** İnme hastalarında bası yarası görülme oranı %6,92 olarak saptanmış olup, en sık lokalizasyon sakrum olarak bulunmuştur. Hastanede açılan yeni bası yarası oranının sıfır olması, rehabilitasyon hastanesinin bası yarası ile ilgili gerekli farkındalığın ve hemşire, refakatçi eğitim düzeyinin oluştuğunu göstermektedir.

**Anahtar kelimeler:** İnme, Bası yarası, Rehabilitasyon

## Introduction

Stroke is a brain vascular disease that affects millions of people in the world every year and causes disability [1]. Complications following a stroke are known to increase hospital stay and patient care costs [2]. European Pressure Ulcer Advisory Panel (EPUAP) defines pressure ulcer as; local injury to the skin and / or subcutaneous injury on the bone protrusion that occurs with pressure or friction with pressure [3]. The pressure ulcer, which occurs as a complication in stroke, has been reported at different rates in different patient populations. It was found to be 0.7% in 140 rehabilitation patients in Singapore, and 18% in a study of 607 patients with acute stroke hospitalized in Scotland after stroke [4,5].

In another study, patients with Barthel Index below 10 were included in the study and the rate of compression sores in stroke was found to be 22% [6]. When we search the education levels of the nurses about pressure ulcers there is a study that investigated the knowledge of intensive care nurses about pressure ulcer in Turkey, 78.8% of nurses reported that they had previously received training about pressure ulcer [7]. Although there have been few studies on pressure ulcers in stroke and information on pressure ulcers of health personnel; to the best of our knowledge, there is no study comparing the rates of pressure ulcer in stroke and in-service training of nurses in the literature. The aim of this study is to investigate the pressure ulcer rates of stroke patients in a public rehabilitation hospital and concurrent in-service training rates of nurses about pressure ulcers.

## Materials and methods

This is an observational study. After obtaining permission from the hospital management for retrospective file scanning, the necessary information was collected from the hospital data in accordance with the Helsinki Declaration. For 3 years (01/01/2016-12/31/2018), the files of inpatient stroke patients in our hospital were retrospectively scanned and the data were collected. The demographic characteristics of the patients, whether they had acute (first 6 months) or chronic stroke during the hospitalization, mean number of days of hospitalization, accompanying pathologies, presence and localization of pressure ulcers during hospitalization, and whether new pressure ulcers developed during hospitalization were recorded. Hospital in-service training unit records were used for personnel training data of the nurses about pressure ulcers. To calculate the rate of nurses participating in training, the number of nurses receiving training on training day was divided by the number of nurses working actively in the hospital on the same day. The same ratio was calculated for the companions. For statistical analysis percentage calculations were used.

## Results

Of the 3640 patients in our hospital, 1776 had stroke and 1216 of these patients had acute stroke (Table 1, 2). The average number of bedtime days for patients diagnosed with stroke was 27.6 days. The demographic characteristics of stroke patients are presented in Table 3 and the accompanying pathologies and rates are shown in Table 4. The number of stroke patients with pressure ulcers during hospitalization was 123

(6.92%) and no new pressure ulcers were found during hospitalization in the rehabilitation hospital. The ratio of the pressure ulcer patients diagnosed with stroke to the total number of hospitalized pressure ulcer patients was found to be 32.97% (Table 5). The most common anatomic localization of pressure ulcer was found to be in sacrum at 65 stroke patients (52.84%), while the least common localization was elbow with 1 patient (0.81%).

In-service training about pressure ulcers given to nurses was 2 times a year and the rate of nurses participating in the training was 71.5%. The number of education provided to the companions about pressure ulcers was 12 per year and participation rate was 57.3%.

Table 1: Stroke and non-stroke inpatient patients

	n	%
Stroke inpatient rehabilitation patients	1776	48.80
Non stroke inpatient rehabilitation patients	1864	51.20
Total	3640	100

Table 2: Acute and chronic stroke ratios

	Number of patients	
	n	%
Acute stroke	1216	68.47
Chronic stroke	560	31.53
Total	1776	100

Table 3: Patients ratios and average age according to gender

	Average age	n	%
Male	64.18 years	1005	56.59
Female	68.78 years	771	43.41
Total		1776	100%

Table 4: Rates of secondary diagnosis in stroke patients

	Patients	
	n	%
Hypertension	1061	59.74
Diabetes mellitus	447	25.16
Hyperlipidemia	241	13.56
Cardiac pathologies	267	15.03
Urinary tract infection	114	6.41
Kidney failure	32	1.80
Pulmonary infection	66	3.71
Deep venous thrombosis	9	0.50
Cancer	10	0.56

Table 5: Pressure ulcer ratios

Ratio of pressure ulcers in stroke patients		Ratio of pressure ulcer patients with stroke diagnosis to the all of patients with pressure ulcers		New pressure ulcers during hospitalization	
Patients	Ratio %	Patients	Ratio %	Patients	Ratio %
123	6.92	123	32.97	0	0

## Discussion

Stroke is a major health problem that affects millions of people all over the world every year. In a study conducted in 195 countries all over the world; the second most important cause of Disability-Adjusted Life Year (DALY) is cerebrovascular diseases [1]. Stroke can occur across very different disease spectrum. Post-stroke hospitalization rates and the cost of the stroke patient to the health system may also vary depending on where the patient is in this wide range of stroke spectrum. It is known that pressure ulcers and similar complications that occur after a stroke increase both the duration of hospitalization and the cost of the disease [2]. When the rates of pressure ulcers after stroke are examined, very different results can be seen; these results vary from 0.7% to 22 % [4,5]. The most important reason for this variability is that the stroke patient profile taken into the study is different from each other and the facility where the study is performed. For example, in the study, where the rate of pressure ulcers in stroke was found to be 22%, study population was patients with a Barthel Index below 10 which means patient profile is more dependent [6]. In another study, stroke patients in

the intensive care unit were taken as a sample and pressure ulcer rate was 28% [8].

In our study, we evaluated 1776 patients with acute and chronic stroke who received inpatient treatment at the Rehabilitation Hospital. We did not use any functional status index as exclusion criteria and we found pressure ulcers in 123 stroke patients (6.92%).

Our data include both acute and chronic stroke cases and assess the rates of pressure ulcer in stroke regardless of all other functional characteristics of the patient.

In a study conducted in a stroke-specific hospital, it was shown that 22% of pressure ulcers found in stroke patients occurred during the hospitalization period [8]. In our study, no new pressure ulcer was detected in patients during their hospitalization period.

Reasons for the absence of new pressure ulcers can be considered as adequate repetitive training for both nurses and companions. Another factor is the fact that patients with active rehabilitation indications are hospitalized rather than unconscious palliative care patients because our hospital is a secondary branch hospital and don't have an intensive care unit.

The most common anatomic localization of pressure ulcers was sacrum, while the least common anatomic localization was the elbow. This data is consistent with current literature [8].

The ratio of nurses who received in-service training for pressure ulcer in the hospital was calculated as 71.5%. This ratio was calculated by dividing the number of nurses who received in-service pressure ulcer training to the number of nurses who were actively working at the hospital on the same day. This ratio does not appear to be low since the inpatient and outpatient clinic services continue while there is in-service training for nurses and there are fixed nurses in charge in these departments during the trainings.

In a study that evaluated the level of knowledge of nurses about pressure ulcers in a training research hospital, it was seen that 78.8% of the personnel who participated in the study had previously received training on the pressure ulcers [7]. Since our study is a retrospective study, the staff was not asked if they had received any training related to the pressure ulcer before, and the rate of nurses actively participating in the training was calculated on the day of training. This rate is expected to rise higher numbers if a questionnaire is prepared by taking into account the previous trainings of nurses about pressure ulcers. The same applies to companions. In our hospital, pressure ulcer trainings are given every month for companions; a companion who has already undergone training may not be able to attend the second training that falls within his or her hospitalization period, or the companion may be a companion who is professional and has already undergone training for pressure ulcers. Questionnaires which evaluate pressure ulcer information level that will be conducted to both companions and nurses in a future prospective study may help us to have more clear information on this issue.

Considering that the most important treatment for pressure ulcer is prevention, nurse and companion training is thought to be closely related to the lack of a newly opened pressure ulcers.

## Limitations

The lack of pressure ulcer staging is the main limitation of the study. In subsequent studies, staging of pressure ulcers may give us more information about the status of the pressure ulcers during hospitalization. Our current prediction is that pressure ulcers have improved in this period due to the absence of new pressure ulcers during hospitalization.

## Conclusion

The incidence of pressure ulcer was 6.92% in stroke patients and the most common localization was sacrum. The fact that the rate of the new pressure ulcer opened in the hospital is zero indicates that the necessary awareness and staff training level regarding the pressure ulcer of the rehabilitation hospital has been established.

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