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Patients admitted to hospital for vestibular neuritis in 2011–2021

SHORT REPORT

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BACKGROUND

The incidence of vestibular neuritis in Norway is unknown. The disorder causes acute dizziness, which is a common reason for hospital admission. The objective of this study was to analyse the number of patients admitted to Norwegian hospitals for vestibular neuritis over an eleven-year period.

MATERIAL AND METHOD

The number of patients admitted to hospital for vestibular neuritis and reported to the Norwegian Patient Registry in the period 2011–2021 was recorded. The figures were compared with the number of patients admitted for other vertiginous disorders.

RESULTS

The number of patients admitted to hospital for vestibular neuritis was 11.2 per 100,000 inhabitants per year (range 8.2–15.3). The number of patients admitted to hospital in the study period increased by an average of 7.9 % per year and was highest in the final year. Out of 63,884 patients admitted for vertiginous disorders in the study period, 6,450 (10.1 %) had vestibular neuritis.

INTERPRETATION

The number of patients admitted to hospital for vestibular neuritis each year increased considerably in the study period. This is likely to be a reflection of the increased hospitalisation rate and improvements in diagnostic workup more than an actual increase in the incidence of the disorder. A minority of patients admitted for vertiginous disorders had vestibular neuritis.

Main findings

In the period 2011–2021, there was a considerable increase in the number of patients admitted to Norwegian hospitals for vestibular neuritis.

In the study period, 10.1 % of patients who were admitted for vertiginous disorders had vestibular neuritis.

Vestibular neuritis – or acute unilateral vestibulopathy – is a condition with acute onset of dizziness and unilateral loss of peripheral vestibular function (1). Typical symptoms are vertigo, nausea, vomiting and unsteadiness. Common findings are spontaneous nystagmus that beats towards the healthy ear and a positive head impulse test towards the affected ear. Hearing is not affected. The disorder is thought to be caused by reactivation of latent herpes simplex virus in the ganglion of the vestibular nerve.

Patients with vestibular neuritis are often admitted to hospital, partly because the symptoms raise suspicions about serious underlying disease, and partly because the patients require acute symptom-relieving treatment and help with

daily care. The symptoms of vestibular neuritis resemble symptoms that may be seen in acute lesions affecting the central vestibular structures in the brainstem and cerebellum, particularly stroke. However, there are few epidemiological studies that document the incidence of vestibular neuritis in the general population.

In this study, we wanted to investigate the incidence of vestibular neuritis and other vertiginous disorders in Norwegian hospitals over an eleven-year period. We also wanted to compare the incidence of vestibular neuritis in the four regional health authorities.

Material and method

In this study, we analysed data from the Norwegian Patient Registry for patients admitted to Norwegian hospitals for vertiginous disorders in the period 2011–2021. The diagnosis codes in the Norwegian Patient Registry represent the primary diagnosis for each hospital admission recorded at discharge. Vertiginous disorders are coded as H81 – Disorders of vestibular function and R42 – Dizziness. Vestibular neuritis is coded under the first group (H81.2). Patients are counted at the health authority where the treatment was given, irrespective of the patient's place of residence. The figures for each calendar year represent unique patients, but do not track individual patients over several calendar years. Incidence of the disorder was calculated as the annual number of patients hospitalised per 100,000 inhabitants. Population data was obtained from Statistics Norway (https://www.ssb.no/statbank).

The figures used in the study are publicly available and contain no directly or indirectly identifiable personal data. Therefore, it was considered that the project did not need to be notified to the regional ethics committees. It also did not require an application to the Norwegian Directorate of Health for the provision and compilation of data from the Norwegian Patient Registry. The figures were downloaded from the Directorate of Health's statistics view for activity at somatic hospitals (https://www.helsedirektoratet.no/statistikk/statistikk-fra-npr/aktivitetsomatiske-sykehus).

Results

Table 1 shows population and the number of patients admitted to hospital for vestibular neuritis and other vertiginous disorders (excluding vestibular neuritis). Figure 1 shows the evolution grouped by regional health authorities. The number of patients admitted to hospital for vestibular neuritis was an average of 586 per year in the study period (range 403–827), corresponding to 11.2 per 100,000 inhabitants per year (8.2–15.3). The number of patients admitted to hospital increased steadily over the study period from the lowest level in 2011 to the highest level in 2021. The number of patients increased by 7.9 % and the population increased by 0.9 % per year on average. Vestibular

neuritis accounted for 10.1 % of patients admitted to hospital for vertiginous conditions. The incidence in the Central Norway Regional Health Authority (12.3 %) exceeded the national average in nine of the eleven years. The incidence in the Northern Norway Regional Health Authority (9.6 %) was below the national average in all of the eleven years of the study. In the Western Norway Regional Health Authority and South-Eastern Norway Regional Health Authority, the incidence was close to the national average (11.4 % and 11.2 % respectively).

Table 1

Number of patients in the population admitted to hospital for vestibular neuritis and other vertiginous disorders from 2011 to 2021.

Year	Norwegian population	Number of patients admitted to hospital per year			
		Vertiginous disorders (excluding vestibular neuritis)[1]	Vestibular neuritis		
			Number	Percentage[2]	Incidence[3]
2011	4,920,305	4,342	403	8.5	8.2
2012	4,985,870	4,603	440	8.7	8.8
2013	5,051,275	4,513	481	9.6	9.5
2014	5,109,056	4,585	439	8.7	8.6
2015	5,165,802	4,978	554	10.0	10.7
2016	5,213,985	5,235	527	9.1	10.1
2017	5,258,317	5,464	592	9.8	11.3
2018	5,295,619	5,392	650	10.8	12.3
2019	5,328,212	6,038	777	11.4	14.6
2020	5,367,580	5,917	760	11.4	14.2
2021	5,391,369	6,367	827	11.5	15.3

[1]In the ICD-10, vertiginous disorders are coded as R42 and H81 and vestibular neuritis as H81.2

[2]Proportion of all patients admitted to hospital for vertiginous disorders including vestibular neuritis

[3]Incidence is stated per 100,000 inhabitants per year

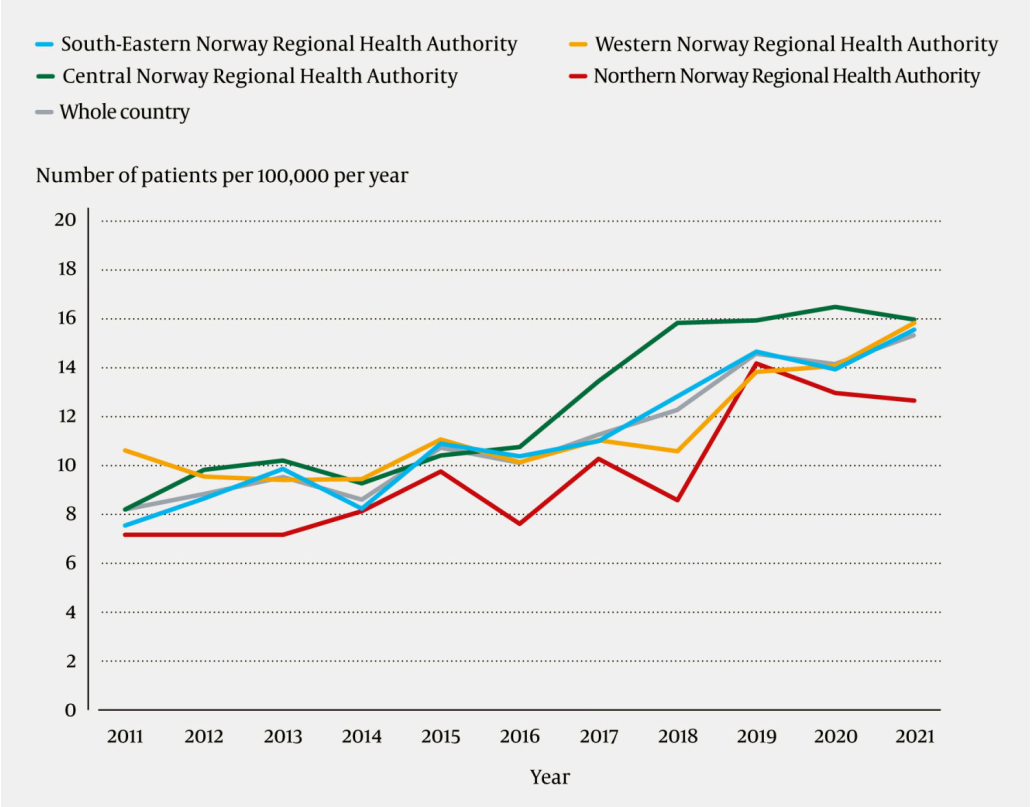

Figure 1 Number of patients admitted to hospital for vestibular neuritis from 2011 to 2021 in the whole country and grouped by regional health authorities. Figures are stated per 100,000 inhabitants per year.

Discussion

The number of patients admitted to Norwegian hospitals for vestibular neuritis has increased substantially from 2011 to 2021 and at the end of this period was close to 15 per 100,000 inhabitants per year. This figure is still low in relation to the number of patients admitted for other vertiginous disorders.

There are very few comparable studies from other countries, but a study from Croatia (2) found an incidence of 15.5 per 100,000 inhabitants per year, which is almost the same as the incidence towards the end of the observation period in our study.

An incidence of vestibular neuritis of approximately 15 per 100,000 per year may still be an underestimate. Expertise in otoneurology is required to make the diagnosis. It is particularly important to be able to detect spontaneous nystagmus, as well as to correctly perform and interpret the head impulse test. Lack of appropriate examination equipment can lead to spontaneous nystagmus being overlooked. Patients with spontaneous nystagmus will also have nystagmus after the Dix-Hallpike manoeuvre and therefore may be incorrectly diagnosed with benign paroxysmal positional vertigo (BPPV). A variant of vestibular neuritis that only affects the inferior division of the vestibular nerve can be difficult to detect.

It is also possible that there may be underdiagnosis as a result of patients being treated outside of hospital. For several reasons, this probably applies to fewer patients than before. Firstly, our study shows that the number of patients admitted to hospital is increasing in all regional health authorities. New guidelines (3) specify that patients who experience sudden onset of persistent

dizziness and nausea should be admitted to hospital as emergencies, including in order to detect and treat stroke. Furthermore, the symptoms of vestibular neuritis are often so intense – and so concerning both to the patient and general practitioner – that hospital admission is appropriate. This is both for diagnostic elucidation, which often includes diagnostic imaging, and for the initiation of required treatment, which in the acute phase often consists of providing patient information, quiet bedrest, antiemetics and optional systemic corticosteroids followed by early mobilisation and rehabilitation.

There is less likely to be any significant overdiagnosis of vestibular neuritis at the expense of more serious conditions such as stroke since access to MRI scanning is generally good at Norwegian hospitals. However, the diagnosis of vestibular neuritis does not require MRI because it is based on clinical criteria (1). In practice, the HINTS criteria (positive head impulse test, peripheral-type nystagmus and absence of skew deviation) are often used (4). It is unlikely that conditions such as Meniere's disease, labyrinthitis and vestibular schwannoma are often confused with vestibular neuritis because they are considerably rarer and usually cause unilateral hearing loss.

The diagnostic workup of vestibular neuritis at Norwegian hospitals has undergone improvements in the study period, and therefore it is likely that the latest figures are the best representation of the actual incidence in the population. Several hospitals have developed their own pathways for patients admitted to hospital with acute dizziness, and two of the country's largest hospitals have recently conducted a randomised controlled interventional trial on consecutive patients with vestibular neuritis (5), which required rigorous diagnostic procedures. For the past 20 years, Norway has had a centralised service for sharing expertise about vestibular disorders (Norwegian National Advisory Unit on Vestibular Disorders). Our study shows relatively small variations between the regional health authorities, even though two of the regions have been systematically above and below the national average, respectively (Figure 1).

The Norwegian Patient Registry collects data about all patients who are treated in the specialist health service, including primary diagnoses for hospital admissions. All organisations in the specialist health service that are wholly or partly publicly funded are required to report into the Norwegian Patient Registry. This mainly includes health trusts, private non-profit hospitals, private for-profit hospitals with tender agreements and specialists in private practice. One strength of our study is that the Norwegian Patient Registry has an extremely high level of completeness, and therefore it is reasonable to assume that we have included the vast majority of patients admitted to Norwegian hospitals for vestibular neuritis in the study period. Prevalence figures in our study can be regarded as an indirect estimate of incidence (new cases of the disorder) since vestibular neuritis usually only affects patients once in their life (6).

In this study, we found a considerable increase in the annual number of patients admitted to hospital for vestibular neuritis in the study period. This is likely to be a reflection of the increased hospitalisation rate and improvements

in diagnostic workup more than an actual increase in the incidence of the disorder. A minority of patients admitted for vertiginous disorders had vestibular neuritis.

The article has been peer-reviewed.

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