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Cataract surgery in Norway 2010–19

ORIGINALARTIKKEL

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BACKGROUND

Cataract surgery is a very common intervention. The objective of this study was to investigate the trends in the number of cataract surgeries in Norway and the characteristics of patients who underwent cataract surgery in the period 2010–19.

MATERIAL AND METHOD

Data on cataract surgery were collected from the Norwegian Patient Registry. The number of cataract surgeries per million inhabitants was calculated on the basis of population data from Statistics Norway.

RESULTS

The number of cataract surgeries in Norway increased from 36 340 in 2010 to 48 291 in 2019. This corresponded to an increase of 21 %, from 7 480 to 9 063 per million inhabitants respectively, in the same period. The average age was 74 years, and more than 90 % of the patients were above the age of 60. The proportion of cataract surgeries among patients older than 60 years remained virtually unchanged through the study period. Women accounted for 60 % of the cataract surgeries in 2010 and 57 % in 2019. The proportion of surgeries performed by contract specialists in the entire period varied from 32 % in Central Norway Regional Health Authority to 62 % in Northern Norway Regional Health Authority.

INTERPRETATION

The number of cataract surgeries increased throughout the period in pace with the population growth in the age group above 60 years. With further population growth and an increasing number of older people, planning for a further increase in the number of cataract surgeries in future years is likely to be required.

Cataract is a very common eye condition that affects large parts of the population. The prevalence increases with age, and the proportion with symptomatic or surgically treated cataracts has been estimated at 50 % among 75-year-olds (1). The condition is treated surgically, usually with phacoemulsification, meaning that the lens is broken up by ultrasound and removed in smaller pieces before an artificial intraocular lens is implanted in the original lens capsule.

Cataract surgery is one of the world's most common surgical interventions, and according to estimates from the WHO, approximately 15 million procedures were performed globally in 2010. The number of patients who have undergone cataract surgery has been estimated at 25–30 million as of 2020 (2, 3). Unfortunately, the majority of the population in some countries has limited access to health care. They are therefore not provided with this effective treatment, and cataracts continue to be a major global cause of blindness (4, 5).

The annual cataract surgical rate varies between 400 and 9 000 per million inhabitants in different countries (2, 6). The number of cataract surgeries in Norway rose from slightly below 3 400 in 1983 to nearly 45 000 in 2003 (7). Thereafter, the number fell and appeared to have stabilised at around 40 000 per year in 2006. This corresponds to approximately 6 000 operations per million inhabitants per year. The same increase was also observed in Sweden (8, 9).

No scientific publications have investigated the trends in cataract surgery in Norway over the last decade. In a Norwegian study in the 1990 s, the average age at cataract surgery was 73 years (10). It has been speculated whether the age of patients who undergo this operation has fallen since, in parallel with improved access and a lower threshold for surgery. Previously, it was claimed that women are at increased risk of developing cataracts, or at least that they more often undergo cataract surgery. This is in accordance with findings in clinical studies from Norway (10, 11); however, also for the gender distribution there is a dearth of information from a larger national patient dataset.

Most health professionals will encounter this patient group, and knowledge about the condition and its treatment is therefore important for all doctors. Knowledge about the number of cataract surgeries and patient characteristics is also essential for future resource planning. The objective of this study was to identify the number of cataract surgeries in Norway over the last decade. In addition, we wanted to investigate the distribution of surgeries between the health regions and identify the proportion of patients who had undergone surgery in hospitals versus by contract specialists, and to examine the patients' age and gender distribution.

Material and method

The underlying data consisted of registrations of procedure code CJE20: phacoemulsification with implantation of artificial lens in posterior chamber (and/or reimbursement code K01 a for contract specialists) in the Norwegian Patient Registry in the period 2010–19. No other procedure codes for cataract surgery were included, but from experience these account for a very small proportion of all cataract surgery patients (12). Data on the number of surgeries, number of patients and their age and gender distribution, nationally and at health region level, were collected. Results are presented at the national level unless otherwise specified. The data were anonymised and provided at aggregate group level.

The Norwegian Patient Registry contains data from publicly funded health services. For eye diseases, this means ophthalmology departments and contract specialists, as well as some private clinics that receive public funding. The number of surgeries performed by private clinics that receive public funding amounted to 657–1 200 per year in the study period and were included in the national figures, but could not be distributed at the health region level. The Norwegian Patient Registry does not collect data from ophthalmologists who are funded privately or through insurance, and this study contains no data from these groups.

An application for access to the information was submitted to the Norwegian Directorate of Health. National population figures for the period 2010–19 were retrieved from Statistics Norway. The project was evaluated by the data protection officer at Oslo University Hospital, who decided that it was not subject to submission to the Regional Committee for Medical and Health Research Ethics.

Results

The number of cataract surgeries and the number of patients who undergo such operations per year in Norway increased in the period 2010–19 (Figure 1). The number of surgeries per million of population increased by 21 % from 7 480 to 9 063 per million inhabitants (Table 1), with a small transient decline in 2014 and 2017. In this period, the age group above 60 years grew twice as fast as the general population. The number of persons who had undergone cataract surgery in the age group above 60 years grew slightly in this period, from 21 383 to 22 890 (Figure 2).

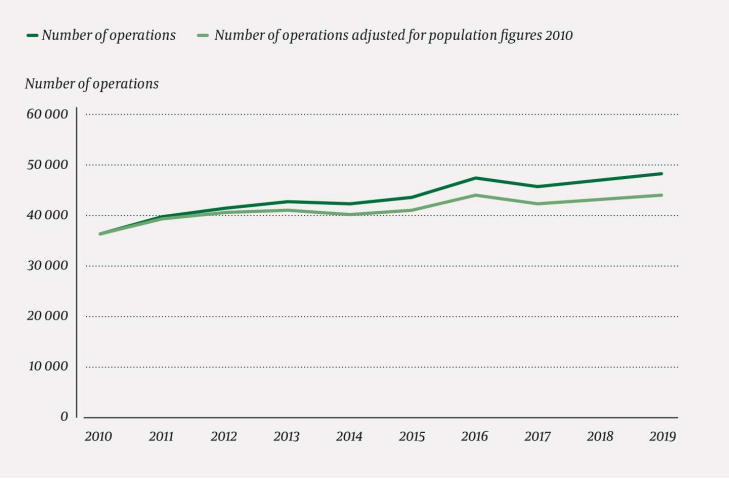

Figure 1 *Number of cataract operations per year in Norway. Adjusted for population growth, with 2010 as the base year.*

Table 1

Cataract operations in Norway in the period 2010–19

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Surgeries	36 340	40 008	41 787	43 017	42 418	43 784	47 603	45 951	47 315	48 291
Patients	22 565	24 793	25 768	26 438	25 775	26 475	28 626	27 569	28 451	29 051
Eyes/patients[1]	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7
Average age (years)	74.6	74.4	74.4	74.2	73.9	74.1	74.1	74.0	74.0	74.1
Sex (women, %)	60	59	59	59	58	58	58	57	57	57
Surgeries per million	7 480	8 131	8 381	8 516	8 302	8 476	9 130	8 739	8 935	9 063
> 60 years										
Patients	20 444	22 435	23 403	24 038	23 383	24 090	26 027	25 118	25 945	26 546
Proportion[2] (%)	2.1	2.3	2.4	2.4	2.3	2.3	2.4	2.3	2.3	2.3

[1]On the assumption of only one eye per operations, which to some extent is a simplification.

[2]Proportion (%) of persons older than 60 years who undergo cataract surgery each year (the proportion of people who already have undergone surgery is unknown).

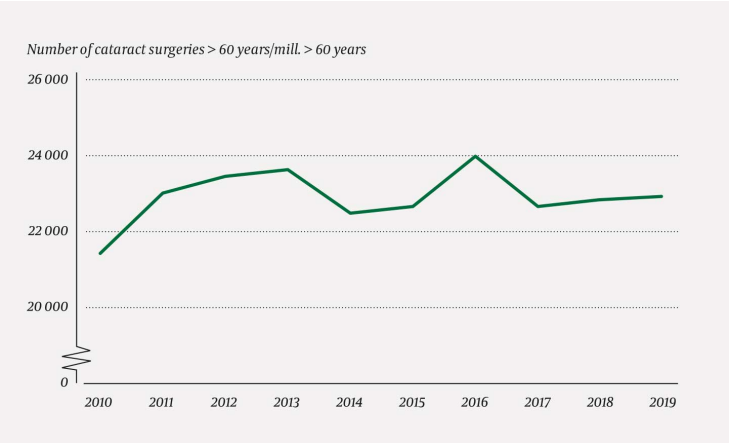

Figure 2 *Number of persons > 60 years who have undergone cataract surgery in Norway per million inhabitants in this age group in the period 2010–19.*

The mean age of the patients was between 74 and 75 years in the entire period, and each year 91 % of those who underwent surgery were above the age of 60 (Table 1). However, there was a considerable increase in the number of patients in the age group 71–80 years, with an annual growth of 5.3 %, while the age group above 80 years showed a slightly declining tendency, with a reduction of 1 % per year. The age distribution for the entire period is shown in Figure 3. Nearly 60 % of the patients were women. Even after adjustment for the gender distribution in the population, women had a higher rate of surgery at 5 526–6 210 surgeries per million women (2010–19), while the corresponding figures for men were 3 749–4 705. Over the period there was a consistent increase for both sexes, with a somewhat higher growth in the number of men who underwent surgery compared to women (an annual growth of 3.7 % and 2.3 % respectively). In the general population > 60 years, women accounted for 55 % in 2010, gradually declining to 53 % through the period.

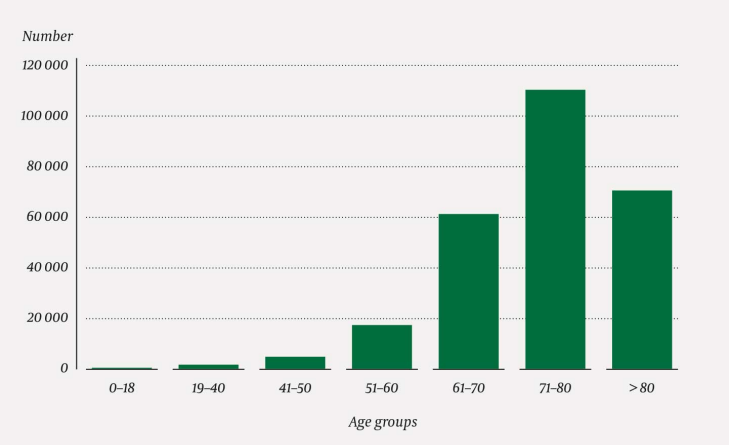

Figure 3 *Number of persons who underwent cataract surgery in Norway in the period 2010–19, by age group (years).*

The proportion of cataract surgeries performed by contract specialists varied annually between 52–60 % in South-Eastern Norway Regional Health Authority (RHA), 38–48 % in Western Norway RHA, 22–36 % in Central Norway RHA and 51–67 % in Northern Norway RHA. South-Eastern Norway RHA accounted for most of the increase in the number of surgeries in the study period, with a growth from 19 832 in 2010 to 27 513 in 2019 (Figure 4).

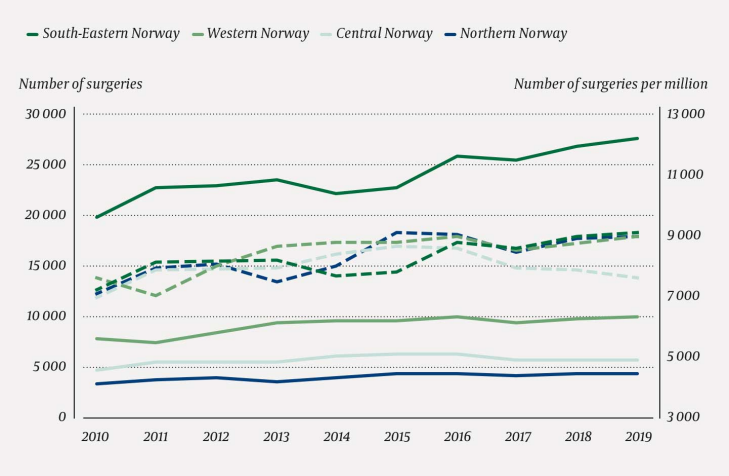

Figure 4 *Cataract surgeries in Norway in the period 2010–19 by health region. Total number of surgeries in the solid lines and the number of surgeries per million inhabitants in the dotted lines.*

Discussion

In this study, we looked at the trend in the number of cataract surgeries and patient characteristics in Norway in the period 2010–19. The number of cataract surgeries increased considerably faster than the general population. A large part of the increase occurred in South-Eastern Norway RHA. The mean age at the time of surgery remained stable in the period, and women accounted for the majority of the patients. The proportion of women who underwent surgery fell slightly in the study period.

In the late 1990 s and early 2000 s the number of cataract surgeries increased considerably in Norway as well as in other western countries. Figures from Norway indicate that the number reached a peak in 2003 before declining slightly (7, 13). One could speculate that by then, most patients with pronounced cataracts had already undergone surgery, and that the number of surgeries in the subsequent years mainly reflected new cases of cataracts needing treatment. In that case, we would have expected a significantly lower number of surgeries per year from 2003 onwards. On the other hand, the threshold for cataract surgery has probably been lowered in line with more liberal indications for surgery, better capacity and shorter waiting times (14).

The increase in the number of cataract operated patients in the study period was in accordance with the population growth in the age group above 60 years (Figure 2). The results of this study did not include operations paid for by the patients themselves or by health insurance. We assume that these account for a very small number of the patients who are in urgent need of surgery, since these will normally be prioritised in terms of waiting time in the public healthcare system. Moreover, some fully private operations are more likely to have been performed on the indication of refraction change rather than cataracts, and any information on the total number of surgeries would thus be difficult to interpret.

The increase in the number of surgeries was most evident in South-Eastern Norway RHA, which can be explained by the greater population growth in this region (Figure 4). In Norway, cataract surgery can be performed by contract specialists, and this proportion has previously been estimated at approximately 50 % of all patients who had undergone surgery

(13). In this study, we found that contract specialists had performed 32–62 % of all cataract surgeries in the period in question. The proportion was lowest in Central Norway RHA and highest in Northern Norway RHA.

Currently, almost 50 000 cataract operations are performed on approximately 30 000 patients by the public health service annually. This corresponds to one-half of the people born each year in Norway 70 years ago. The average number of eyes operated on per patient was estimated to be 1.7. Most patients undergo surgery on both eyes. In this estimate, we assumed that only one eye is treated per operation. This has traditionally been the norm, but there are exceptions in which immediate sequential bilateral cataract surgery is performed. Among the patients who were registered with only one operation in the study period, some had most likely undergone surgery on the other eye before the study period, and others thereafter. The real number of patients who are operated on both eyes is therefore higher than reported in this study. With the increase in the rate of cataract surgery in the 1990 s, there was a clear tendency towards performing surgery on both eyes (in two sessions) in most patients. In Sweden, it was shown that 'second-eye' surgery accounted for much of the increase in the number of operations in the 1990 s (9).

The vast majority of cataract surgery patients in Norway are in the age group above 60 years. The mean age has remained stable in recent years. This study found no indications that cataract surgery is increasingly performed on younger people. Life expectancy is increasing, and this may potentially lead to a growing number of surgeries on patients of very advanced age, as has previously been found in Sweden (9). This might thus balance out the fact that some are younger without changing the mean age. We had no access to data on changes over time within the age group above 80 years. Furthermore, our data did not include patients who were operated in private clinics, and it is possible that younger patients are more often treated in private clinics. Increased expectations of freedom from spectacles and implantation of more sophisticated intraocular lenses might turn the focus towards younger patients, and result in surgery on eyes with little or no cataracts ('clear lens extraction'). In Norway today, this procedure is performed more or less exclusively in fully private clinics. Depending on the proportion of the population that this group accounts for, one might speculate whether this change in practice will reduce the need for cataract surgery in the public health service in the future. The data in this study did not include less common procedure codes for cataract surgery, and the procedure code was not linked to a diagnosis of cataracts, which makes for some uncertainty in the results.

There was a higher proportion of women among the cataract surgery patients during the study period, although with a slightly declining tendency. In parallel, there was a gradual reduction in the proportion of women over the age of 60 in the general population. We are not aware of any previous studies that have shown the nationwide gender distribution of cataract surgery in Norway. However, it has been shown in Sweden, where a significant preponderance of women was found among cataract surgery patients in the 1990 s (8). The same tendency has also been identified in clinical studies in Norway (10, 11), the United States (15) and a number of other countries. It has been debated whether this difference can be ascribed to biological, age-related changes in the lens, different perceptions of visual impairment (16), different tendencies in referrals of men and women for surgery (17), and higher life expectancy for women. Most likely, the cause is a combination of these factors.

Given the steady increase in the number of cataract operations in Norway, the future requirements for resources need to be considered, as also pointed out in the Konus report of the Norwegian Ophthalmological Society in 2012 (18). Reinforcement of hospital department resources could be crucial for maintaining a sufficient level of surgical training and high competence. Immediate sequential bilateral cataract surgery is being discussed and to some extent increasingly performed (19), which also may lead to cost savings in the form of fewer post-operative check-ups. To cover the hospitals' increased costs for performing immediate sequential bilateral cataract surgery, a change in funding is likely to be required; currently this only provides for a small increase in the reimbursement as

compared to unilateral surgery. The need for pre-operative assessment both by the referring doctor and the eye surgeon, as frequently practised today, should also be re-considered. Also, the number of post-operative check-ups can likely be reduced (20). Task sharing in the form of examinations performed by an optician or a nurse is already practised, and the use of this alternative can probably be expanded.

Conclusion

This study shows that the number of cataract surgeries has gradually increased in Norway over the last decade, also when adjusted for population growth. The number of surgeries undertaken by the public health service has reached nearly 50 000 per year, one-half of which are performed by contract specialists. The patients' mean age has remained stable at 74 years, and more women than men undergo surgery. At least the same number of surgeries per million inhabitants as today should be planned for in the future.

MAIN FINDINGS

In the period 2010–19, the number of cataract surgeries in Norway increased from 7 480 to 9 063 per million inhabitants.

Nine out of ten patients were above the age of 60, and the proportion who underwent surgery in this age group remained almost stable.

More women than men underwent cataract surgery.

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