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DOI

[10.1111/j.1399-6576.1992.tb03561.x](https://doi.org/10.1111/j.1399-6576.1992.tb03561.x)

Publication date

1992

Document Version

Final published version

Published in

Acta anæsthesiologica Scandinavica

[Link to publication](#)

Citation for published version (APA):

Moerman, N., van Dam, F. S. A. M., & Oosting, J. (1992). Recollections of general anaesthesia: a survey of anaesthesiological practice. *Acta anæsthesiologica Scandinavica*, 36, 767-771. <https://doi.org/10.1111/j.1399-6576.1992.tb03561.x>

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Recollections of general anaesthesia: a survey of anaesthesiological practice

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In order to identify the factors to which patients attach importance when undergoing general anaesthesia, 678 patients were retrospectively asked about their recollections of previous anaesthetics during routine preoperative screening over a period of 14 months. The most frequently mentioned recollections concerned the post-anaesthetic period, followed by recollections of the induction of anaesthesia. From the post-anaesthetic period, nausea/vomiting and drowsiness were most often cited. The number of anaesthetics previously undergone had no influence on the reports of the two most frequently mentioned complaints. The rate of nausea/vomiting in this series was 21.0%. The number of patients reporting nausea/vomiting following an anaesthetic has not changed over the years. The last 250 patients were asked to assess the quality of their anaesthetics on a 5-point scale. More than a quarter of the patients were not satisfied with the anaesthesia. No correlation was found between the assessment of the anaesthesia and complaints about nausea/vomiting and drowsiness. The possible role of psychological factors in the origin of complaints about anaesthesia is discussed.

Received 18 November 1991, accepted for publication 3 March 1992

Key words: Anesthesia, general; anesthesia, side effects, nausea and vomiting; memory of anesthesia; patient experience; quality of anesthesia.

What recollections do patients have of anaesthesia they have undergone? Because previous anaesthetics can, to some extent, influence a patient's expectations of a new anaesthesia (1), it may be important to know what the patient remembers. Most of the information on this subject in the literature has been acquired by the use of extensive questionnaires (2-6) or interviews (7-10). Both methods are time-consuming and impractical for the working anaesthetist. Knowledge about the patient's recollections can be acquired more easily using the data from routine preoperative interviews, done by the anaesthetist. In our anaesthesiological out-patient clinic, patients are, in a systematical way, routinely asked about previous experiences of anaesthesia. In this way, misconceptions can be revealed and corrected. Collecting these data over an extended period of time provides insight into what patients consider to be important.

PATIENTS AND METHODS

A convenient sample of patients ($n=678$) visiting the anaesthesiological out-patient clinic for routine preoperative screening participated in this study. The sample consisted of all patients scheduled for day surgery and those patients who were admitted to the hospital on a Sunday and for whom clinical anaesthesia was planned. During a period of 14 months, those patients who had undergone previous

general anaesthesia were asked the simple question: "What do you remember about your previous anaesthetics?" The answers were recorded immediately. There were no specific questions relating to complications or side-effects. When there was a language barrier or any other communication problem, the patients were excluded from the survey. The last 250 patients were also asked to assess their satisfaction with previous anaesthetics on a 5-point scale, from very bad, bad, reasonable, good to very good. All questions were asked by the same anaesthetist.

Statistical analysis was performed with the BMDP statistical software package (11), using the chi-square test in relation to a Trend test in proportions (12). Differences were considered statistically significant when the P -value was less than 0.05.

RESULTS

Data on 678 patients (449 women and 229 men) were collected. The high percentage of women can be explained by the large number of patients attending for a gynaecological or obstetrical procedure. The age of the patients interviewed varied from 6 to 83 years, with a median of 33 years. The median time between the operations and the interview was 7 years.

These 678 patients underwent 1236 general anaesthetics. Of these general anaesthetics, 1060 were recollected by the patients, giving rise to 991 remarks.

Table 1 shows how the recollections are distributed over the different periods of anaesthesia (pre-anaes-

* Group: 0-5, 6-10, 11-15, 16-20, >20 years ago.

Table 5
The patients' assessment of general anaesthesia (n = 402).

Very good	1.0%
Good	13.9%
Reasonable	58.2%
Bad	19.2%
Very bad	7.7%

The second most frequently mentioned complaint following general anaesthesia is a feeling of drowsiness. 8.3% of patients suffered from this, and there was no difference between men and women ($\chi^2=0.8$, $df=1$, $P=0.37$). The longer the time interval between the operation and the interview, the fewer the reports of drowsiness ($\chi^2=18.0$, $df=4$, $P=0.006$, linear trend $P=0.001$) (Table 4). This trend is also apparent in the case of patients with only one previous experience of general anaesthetic ($\chi^2=7.1$, $df=3$, $P=0.07$, linear trend $P=0.02$), but is in contrast with the findings regarding post-operative nausea/vomiting.

Here too, we examined the question of whether the number of operations undergone had an influence on the reports of drowsiness. As with post-operative vomiting, this turned out not to be the case. There seems to be no relationship between the number of general anaesthetics and reports of drowsiness. In the first experience of anaesthesia ($\chi^2=5.1$, $df=4$, $P=0.65$) as well as in the last ($\chi^2=2.1$, $df=4$, $P=0.56$), the percentage of reports of drowsiness was not related to the number of anaesthetics experienced.

The last 250 patients were asked to rate their satisfaction with previous anaesthetics. Table 5 shows the results. Over a quarter of general anaesthetics were assessed as being bad or very bad. A survey was carried out into the possibility of the assessment being related to the patients' complaints. As in this case too, there is a chance that one experience of anaesthesia may influence others, we once again restricted research to the group of patients with only one previous experience of anaesthesia. In this group no relationship was found between the patient's assessment and the presence of post-operative nausea/vomiting ($\chi^2=2.6$, $df=2$, $P=0.27$). Equally, no connection was found with drowsiness ($\chi^2=0.2$, $df=2$, $P=0.93$).

DISCUSSION

In the present study patients were encouraged to talk spontaneously about what they felt was important about their previous anaesthetics. There was a remarkable emphasis on complaints experienced in the post-anaesthetic period. The majority of the complaints,

known about and described in the literature for years, such as nausea, drowsiness, micturition problems, sore throat, headache and dizziness are still experienced today. The most frequently mentioned complaint is post-operative nausea. This concurs with other research, focussing on post-operative complaints. The figures given for post-operative nausea in the literature vary from 19.4% to 55% (13), not showing any improvement over the years. The figure for nausea in our series is 21%. Our data show that this percentage is fairly stable (Table 4). There is no significant difference between the percentage of complaints about nausea after recent anaesthetics and anaesthetics undergone a long time ago. However, one should remember that 'nausea' has different meanings. The nausea a patient remembers from years ago could have quite a different significance to nausea of a more recent date. There is also no information on the intensity of the nausea.

Based on this retrospective study it is not possible to explain why the percentage of nausea/vomiting has not changed, whereas this could have been expected given the new anaesthetic drugs available and the improved anaesthesiological techniques in use today. However, one factor must be borne in mind. While anaesthetic drugs have improved a great deal over the years, opioids are still widely used. Although the newer opioids are more potent, they have nevertheless retained their emetic properties. A further factor causing nausea and vomiting might be of a psychological nature. During the preoperative interview, for example, it is striking how many people imagine that they will feel nauseous after undergoing a general anaesthetic, even if they have had no previous experience of anaesthesia.

The second most frequent complaint, drowsiness, is more often mentioned in connection with a recent anaesthetic than with those which took place less recently. This contradicts previously published data on a smaller series of patients (14).

Another striking point is that over a quarter of the patients assessed the general anaesthesia as being 'bad' or 'very bad'. Based on this study, there seems to be no clear connection with the presence of nausea or drowsiness. One explanation could be that patients assessed the events surrounding the general anaesthesia rather than the quality of the anaesthesia itself. In the present research it was clear that patients accepted a number of side effects as being a "normal" part of general anaesthesia. This has also been described elsewhere (1, 2). A comparative study into the effects of a number of anti-emetics (15) showed that 81% of the patients who experienced nausea and 42% of the patients who vomited, rated their overall postoperative

state as satisfactory. This discrepancy between the rating and the occurrence of side effects is remarkable. Satisfaction with medical procedures is not always based on the complaints and symptoms patients have. Other factors, such as communication with their doctor, may play a prominent role. A complicating factor which may also account for this discrepancy is the possible perception of the patient during general anaesthesia. There is now evidence that some information processing functions of the brain remain intact even during adequate general anaesthesia (16, 17). Just as postoperative behaviour can be influenced by subconscious perception during anaesthesia (18), it is conceivable that in the same way this could affect the patient's postoperative assessment of the anaesthesia. It is clear that further research is needed to reveal the ground on which patients assess the general anaesthesia itself.

After the post-anaesthetic period, the induction of anaesthesia is often mentioned. The method of induction, either with a mask, an injection or intravenous drip assumes an important place in the patient's recollections. The mask in particular, is accompanied by negative recollections such as anxiety, lack of air and the feeling of suffocation. Induction causes other unpleasant memories too, such as falling into a deep pit, a black hole or a tunnel, as well as pain caused by the injection. Generally speaking, anaesthetists attach too little significance to this stage of the anaesthesia, even though this is the moment at which their intervention could help the patient to have a more pleasant experience (19–21).

It is striking that only two recollections of the period during the anaesthesia itself were mentioned. These two cases of 'awareness and recall' are described elsewhere (14). The figure of 0.2% is low compared with a recently published survey in which the incidence of awareness was as high as 5.3% (22), but equals the frequency in another recently published study of 1000 patients (23). Awareness can also be interpreted as a dream (24). Although dreams are also noted as a recollection of anaesthesia (25), they were not mentioned at all in our series. It has been said that dreams and experiences of awareness are often not related spontaneously, but sometimes come to light only when asked about explicitly (4, 24, 26). A possible explanation for the low incidence of awareness and absence of dreams in this series could be the lack of explicit questions on the subject and the patient's reluctance to mention these spontaneously.

A general anaesthetic will undoubtedly always be accompanied by side effects. From the present study, one could conclude that complaints which occurred in the past still occur today and, in fact, some of them occur just as frequently. Given that most patients ex-

pect to experience nausea after an anaesthetic, the question arises of whether the patient's attitude gives rise to and influences complaints about an anaesthetic. Further research is needed to determine the extent to which psychological factors play a part in the physical complaints associated with anaesthesia.

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