

# Practice preferences of ophthalmic anaesthesia for cataract surgery in Singapore

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## ABSTRACT

**Introduction:** This study aims to describe the preferences of ophthalmic anaesthesia for cataract extraction among ophthalmologists in Singapore.

**Methods:** A nationwide questionnaire survey of all cataract surgeons in institutional and private practice in Singapore was conducted in August 2004.

**Results:** The response rate was 61.1 percent (88 out of 144 eligible ophthalmologists surveyed). Phacoemulsification was the preferred surgical technique for 92 percent of the respondents while extra-capsular cataract extraction was preferred by eight percent. For all surgeons performing phacoemulsification, the anaesthesia technique of choice was peribulbar anaesthesia for 43 percent, topical anaesthesia for 42 percent, retrobulbar anaesthesia for 13 percent, and sub-tenons and general anaesthesia for one percent each of the respondents. For all the surgeons performing extra-capsular cataract extraction, the preferred anaesthetic technique was peribulbar anaesthesia for 69 percent, retrobulbar anaesthesia for 30 percent and sub-tenons anaesthesia for one percent of the respondents. The surgeons' main reasons for choosing a specific anaesthesia modality for their surgery were patient comfort and surgeon's choice. The majority of surgeons used mild sedation and monitored anaesthesia care for their cataract surgeries.

**Conclusion:** Peribulbar anaesthesia is currently the preferred anaesthesia technique for both phacoemulsification and extra-capsular cataract extraction in Singapore. Topical anaesthesia closely

follows peribulbar anaesthesia as a preferred choice for phacoemulsification.

**Keywords:** cataract extraction, extra-capsular cataract extraction, ophthalmic anaesthesia, phacoemulsification

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## INTRODUCTION

Cataract surgery is the most commonly performed intra-ocular surgery worldwide, including Singapore.<sup>(1)</sup> The anaesthesia used for these surgeries has been evolving.<sup>(2)</sup> Current options include various regional anaesthesia techniques (retrobulbar anaesthesia [RA], peribulbar anaesthesia [PA] or sub-tenons anaesthesia [STA]), topical anaesthesia (TA) and general anaesthesia (GA). There are notable differences in the preferences, practice patterns and trends of ophthalmic anaesthesia in different countries.<sup>(3–18)</sup> This survey aims to document the practice preferences of ophthalmic anaesthesia for cataract surgery among ophthalmologists in Singapore.

## METHODS

A questionnaire survey of all practising cataract surgeons in both public hospitals as well as the private sector in Singapore was conducted in August 2004 after obtaining ethics approval from the institutional review board. Cataract surgeons were defined as ophthalmologists who had performed at least one cataract surgery in the last three months before the survey. A list of registered specialist ophthalmologists was obtained from the Ministry of Health, Singapore. In addition, all ophthalmologists who had completed their residency but were not yet registered in the Ministry of Health's roll of specialists were also included in the survey. The questionnaires were not marked and the responses were completely anonymous to encourage participation. There was no financial reward for returning the questionnaire.

## RESULTS

Questionnaires were sent to 144 eligible ophthalmologists. There were 96 ophthalmologists from public hospitals and 48 from private practice. Responses were received

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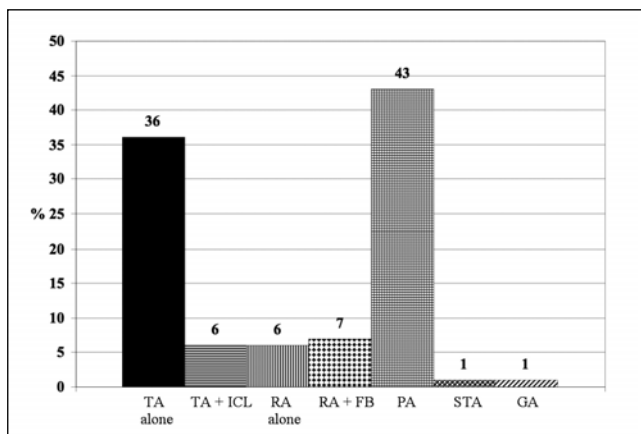
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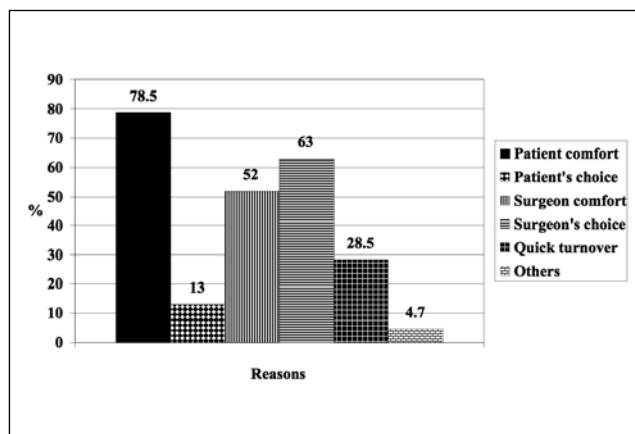
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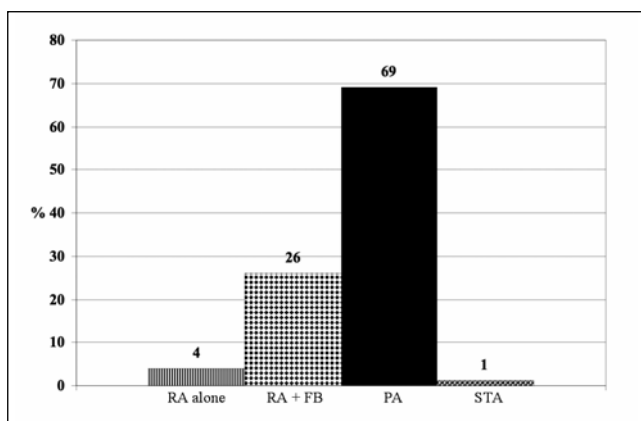
**Fig. 1** Anaesthesia preferences of all surgeons who performed phacoemulsification.

TA: Topical anaesthesia; ICL: Intracameral lignocaine; RA: Retrobulbar anaesthesia; FB: Facial block; PA: Peribulbar anaesthesia; STA: Sub-tenons anaesthesia; GA: General anaesthesia



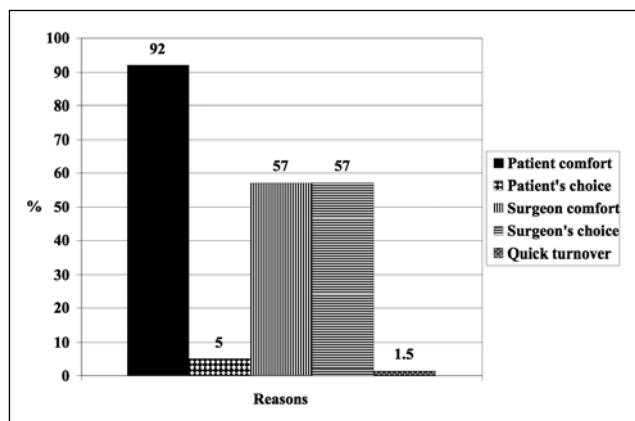
**Fig. 3** Reasons given by surgeons performing phacoemulsification for choosing a specific anaesthesia modality.

\* Percentages do not add up to 100% because respondents were allowed to give one or more reasons.



**Fig. 2** Anaesthesia preferences of all surgeons who performed ECCE.

RA: Retrobulbar anaesthesia; FB: Facial block; PA: Peribulbar anaesthesia; STA: Sub-tenons anaesthesia



**Fig. 4** Reasons given by surgeons performing ECCE for choosing a specific anaesthesia modality.

\* Percentages do not add up to 100% because respondents were allowed to give one or more reasons.

from 88 (61.1%) ophthalmologists. One incomplete response was excluded from the analysis. The response rates from public hospitals and private practice were 75% and 33.3%, respectively. The majority of surgeons (80; 92%) preferred phacoemulsification as the surgical technique of choice for most of their cataract surgeries, while a minority (7; 8%) preferred extra-capsular cataract extraction (ECCE). 24 (27.5%) surgeons performed only phacoemulsification for all their routine cataract surgeries, while three (3.4%) surgeons performed ECCE for all their surgeries. For those who performed phacoemulsification, the preferred anaesthesia technique was PA in 43% of respondents and TA in 42%. Of the surgeons who performed phacoemulsification under TA, the majority (86%) preferred TA without intracameral lignocaine while

14% used supplemental intracameral lignocaine (Fig. 1). For those who performed ECCE, PA was the choice in 69% of the respondents (Fig. 2).

The reasons for the surgeons' preference of anaesthesia techniques are shown in Figs. 3 and 4. Patient comfort was given top priority with both phacoemulsification (78.5%) and ECCE (92%) followed by surgeon's choice (63% with phacoemulsification; 57% with ECCE). Of all the surgeons who preferred TA, a quick turnover time was the reason given by 27% of respondents. The majority of the surgeons operated with monitored anaesthesia care (MAC) provided by an anaesthetist (87% for phacoemulsification and 70% for ECCE). Mild sedation, defined as the level of sedation in which the patient is easily arousable and can respond

to verbal commands, was preferred as a supplement to the anaesthesia by majority of respondents (76% for phacoemulsification and 64% for ECCE).

## DISCUSSION

The response rate in our survey (88/144, 61.1%) is better than those in the more recent surveys from the United States of America (USA) (985/6350, 15.5%)<sup>(3)</sup> and Japan (457/930, 49%)<sup>(4)</sup> and comparable to that of a Canadian survey (353/698, 67%)<sup>(5)</sup>. A New Zealand survey had a much better response rate (84/103, 84%), which was attributed to reminder letters that were sent to the participants.<sup>(6)</sup> The practice preferences of surgeons surveyed in our study are similar to those from other developed countries and phacoemulsification was the preferred surgical technique.<sup>(3-9)</sup> The relatively higher proportion of respondents in our survey whose main technique was ECCE may reflect the training of junior ophthalmologists in Singapore, all of whom begin with ECCE before progressing to phacoemulsification.

Anaesthesia preferences for cataract surgery appear to vary considerably across the world. Longitudinal data is available from some countries, notably the USA, Japan, New Zealand and the United Kingdom (UK).<sup>(3,4,6,7)</sup> We compared our results with the more recent surveys conducted in these countries from 1999 to 2004 (Table I). In our study, PA was the preferred choice for both phacoemulsification and ECCE. TA closely followed PA as a choice for phacoemulsification. This is similar to the practice pattern in the UK but differs from that in the USA, Japan and New Zealand.<sup>(3,4,6,7)</sup> TA with intracameral lignocaine is the preferred modality in the USA.<sup>(3)</sup> The majority of

surgeons using TA in our survey, however, did not use intracameral lignocaine. Interestingly, while STA is the preferred choice in Japan<sup>(4)</sup> and New Zealand,<sup>(6)</sup> it is rarely used in Singapore.

A survey of the delegates who attended the 2002 Congress of the International Council of Ophthalmology, held in Sydney, Australia also found PA to be the most frequently employed anaesthesia modality for cataract surgery.<sup>(19)</sup> However, this survey cannot be taken as representative of actual global practice because of a disproportionate representation from the host country. Participants in our survey were asked to provide reasons for preferring a particular anaesthesia technique. The reasons were classified as patient comfort, patient's choice, surgeon comfort, surgeon's choice, quick turnover time and any other reasons. Patient comfort as perceived by the surgeon encompasses factors such as lack of pain and an overall pleasant experience during surgery. Patient's choice indicated whether the surgeon considered this to be an important factor for the choice of anaesthesia technique. Surgeon comfort covers factors related to the ease of performing surgery. Surgeon's choice indicates the anaesthesia technique that the respondent is most comfortable with; and this would be based on training, experience and personal preferences. A quick turnover time is a rough indicator of the effect of volume of surgery on the choice of anaesthetic technique.

Patient comfort (as perceived by the surgeon) was the most important factor for surgeons to decide the anaesthesia technique for both phacoemulsification and ECCE in our survey. However, very few participants gave patients an opportunity to choose the anaesthesia

**Table I. Comparison of data on anaesthesia preferences for cataract surgery from surveys conducted from 1999 to 2004.**

Anaesthesia technique	Singapore (2004)† (n = 88) (%)	USA (2003) †‡ Leaming <sup>(3)</sup> (n = 985) (%)	New Zealand (2001)† Elder and Leaming <sup>(6)</sup> (n = 84) (%)	UK (1998-2002)† Johnston et al <sup>(7)</sup> (n = 162) (%)	Japan (1999)†‡ Oshika et al <sup>(4)</sup> (n = 457) (%)
TA alone	34	17	0	33.3§	26
TA + ICL	6	44	12		4
PA	44	17	23	47.7	4
RA alone	6	11	9	0.8§	10
RA + FB	8	9	3		11
STA	1	2	51	16.8	42
GA	1	0	0	0.9	0
Others¶	0	0	2	0.5	0

TA: Topical anaesthesia; ICL: Intracameral lignocaine; PA: Peribulbar anaesthesia; RA: Retrobulbar anaesthesia; FB: Facial block; STA: Sub-tenons anaesthesia; GA: General anaesthesia

† Year of survey.

‡ Most recently-published surveys from these countries have been used for comparison.

§ Details of intracameral anaesthesia and facial block are not available.

¶ Other modalities, e.g. subconjunctival anaesthesia.

technique. Interestingly one surgeon in private practice preferred either TA or GA and believed in giving the patient a choice between the two. Patient preferences of anaesthesia for cataract surgery may differ from what surgeons consider to be appropriate for them. In one study, patients appear to have a preference for blocks over TA.<sup>(20)</sup> The majority of the surgeons in our survey chose mild sedation to complement the anaesthesia and operated with an anaesthetist present during cataract surgery. This is similar to the practice in the UK where the majority of cataract surgeries are performed with MAC (96%) and an anaesthetist available during surgery (84%).<sup>(8)</sup>

The limitations of our survey are its voluntary nature and lack of information on the volume of surgery and experience of surgeons. We are unable to stratify the results based on surgeon characteristics. Also, preferences of those who did not take part in the survey (39%) could not be included. In conclusion, notable differences exist in anaesthesia preferences for cataract surgery across the world. In Singapore, phacoemulsification is the most preferred technique for cataract surgery. PA is the preferred modality of anaesthesia for both phacoemulsification and ECCE, while TA closely follows PA as the choice for phacoemulsification.

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