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## Comparison of patient anxiety, pain perception, AC reaction between 1<sup>st</sup> and 2<sup>nd</sup> eye cataract surgery in a tertiary care centre in Tamil Nadu

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### Article Info

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### ABSTRACT:

**Background:** Cataract remains one of the most significant cause of blindness in the world. Effective pain and anxiety management during cataract surgery are crucial for patient comfort and procedure prognosis.

**Objectives:** 1. To determine preoperative anxiety and information scores using the Amsterdam Preoperative Anxiety and Information Scale (APIAS).

2. To assess postoperative pain using the Numerical Pain Rating Scale 6 hours post-surgery.

3. To compare anxiety and pain perception between the first and second cataract surgeries.

4. To compare the anterior chamber reaction post first and second cataract surgery.

**Methodology:** The study, conducted over a year in the Department of Ophthalmology, included 75 patients undergoing successive cataract surgeries. Preoperative anxiety and information scores, postoperative pain, comfort, and anterior chamber (AC) cell count were assessed. Statistical analysis and ethical considerations were applied.

**Results:** Participants exhibited a mean age of  $60 \pm 8$  years, with a female preponderance of 58.3%. The first cataract surgery group showed significantly higher preoperative anxiety and information scores, lower postoperative pain, and higher postoperative comfort. AC cell counts increased in subsequent surgeries.

**Conclusion:**

Elevated anxiety and patient seeking more information were noted in initial surgeries, while subsequent surgeries were associated with increased pain, anterior chamber reaction and decreased comfort. These findings underscore the importance of tailored interventions and counselling to enhance patient experiences, meet expectations and satisfaction during sequential cataract surgeries.

**Keywords:** Cataract, Surgery, Preoperative anxiety, Postoperative pain, Sequential surgeries.

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## 1. Introduction

Cataract remains a significant contributor to worldwide visual impairment, predominantly in developing regions.<sup>1</sup> Cataract is estimated to be the cause of blindness for more than 10 million individuals worldwide and moderately or severely impairs the vision of over 35 million others.<sup>2</sup> Despite recent technological advancements, such as the implementation of phacoemulsification, and increased global outreach and awareness, cataract remains a significant global health burden. Considerable progress has been made in understanding the epidemiology, risk factors, pathogenesis, and association of cataract with particular systemic diseases over the last few decades.<sup>3,4</sup> Population growth and ageing, according to the WHO, will enhance the likelihood that a greater number of individuals will develop vision impairment.<sup>5</sup>

When performing surgery, topical anaesthesia is favoured in order to facilitate the patient's recovery and also helping reduce patient turnover time and making it comfortable for the patient.<sup>6</sup> Nevertheless, research indicates that topical anaesthesia induces pain ranging from 34% to 90% during and after surgery,<sup>7-9</sup> in addition to this positive characteristic. Patients remain conscious throughout the operation in order to comply with the surgeon's instructions; this may induce anxiety<sup>10</sup> and result in adverse physiological parameter changes, including hypertension or tachycardia.<sup>11</sup>

Prior to undergoing surgery, patients may experience extreme anxiety due to the dread of experiencing discomfort and visual impairment.<sup>12</sup> Patients who are unable to maintain stillness throughout the operation may do so out of fear and discomfort. Consequently, pain and anxiety management during the operation are crucial for assuring patient comfort and determining the success of the procedure.<sup>13</sup> The effective management of pain and anxiety during cataract surgery not only mitigates patients' anxiety but also enhances their level of cooperation.<sup>11</sup>

### Objective:

1. To determine the preoperative anxiety and information scores of the patient using Amsterdam preoperative anxiety and information scale (APIAS).
2. To determine the visual pain analogue score and anterior chamber reaction in the postoperative period, 6 hours after the application of pad and bandage.
3. To compare the anxiety and pain perception by the patient between the first and the second cataract surgery.

### Material and Methods

**Study design and setting:** The study was conducted in the Department of Ophthalmology at a tertiary care centre over a period of one year.

### Sample size:

According to the previous literature,<sup>14</sup> prevalence of cataract surgery was taken as 27.6%, the sample size was calculated using the formula,  $4pq/L^2$ . With the relative error of 11%, the sample size was arrived at 66.1. 10% of the sample size was added as non-response rate. The final minimum sample size was calculated to be 73.

Totally 75 patients undergoing successive cataract surgery were included in the study after obtaining institutional ethical clearance.

**Study participants:**

**Inclusion criteria:** Patients with uncomplicated senile cataract planned for phacoemulsification and posterior chamber IOL implantation under peribulbar anaesthesia, who were willing to participate in the study after providing informed consent.

**Exclusion Criteria:**

1. Any intraoperative or postoperative complications.
2. Complicated cataract
3. Patients not psychologically sound or cooperative to take part in the study.

**2. Methodology**

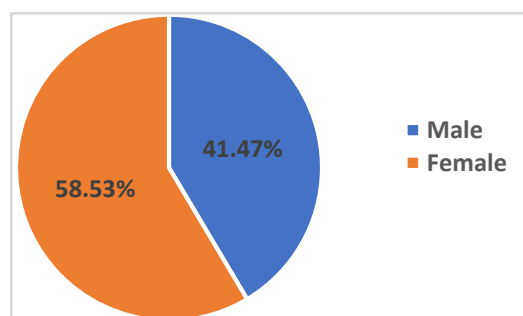
After obtaining informed consent, patients with cataract planned for cataract surgery were included in the study. The study group comprised patients with uncomplicated senile cataract planned for phacoemulsification and posterior chamber IOL implantation under peribulbar anesthesia. Preoperative anxiety scores were calculated using the Amsterdam Preoperative Anxiety and Information Scale (APIAS), with a score of more than 11 on the anxiety index denoting an anxious patient. Six hours postoperatively, patients' pain perception was recorded using the Numerical Pain Rating Scale. The inflammation in the anterior chamber post cataract surgery was graded on the first operative day by using a slit lamp biomicroscope. All patients received the same pre and postoperative medications. Responses were documented and repeated for the second eye surgery, performed under similar settings. Anxiety levels and pain perception were then compared between the two surgeries.

**Statistical analysis:****Ethical considerations:**

Institutional ethical clearance was obtained before the commencement of the study. All participants provided informed consent, and the study was conducted in accordance with ethical guidelines and standards.

**3. Results**

The demographic details of the participants are shown in Fig.1. The mean age of the study participants was  $60 \pm 8$  years. Female preponderance was observed in the study with 58.3 % and males 41.3%.



**Fig.1. Gender distribution among the study participants**

Table 1: Association between pre-op Anxiety score and the sequence of cataract eye surgery (first versus second) among the study participants (n=75)

S.No	Variables	Mean $\pm$ SD	Mean difference	T value	p value
1	<b>Pre-op Anxiety Scoring</b>				
	1 <sup>st</sup> cataract surgery	13.20 $\pm$ 1.98	2.253	8.870	0.001*
	2 <sup>nd</sup> cataract surgery	10.95 $\pm$ 2.57			

**\* P Value < 0.05 - Statistically Significant At 95% Confidence Interval**

Table.1 shows the mean  $\pm$  standard deviation (SD) of preoperative anxiety scores for participants undergoing their first and second cataract surgery. The mean difference between the two groups is 2.253. The t-value of 8.870 with a p-value of 0.001\* indicates a statistically significant difference in preoperative anxiety scores between the first and second cataract surgery groups. There is a notable variation in preoperative anxiety levels based on the sequence of cataract surgery, with participants undergoing the first surgery exhibiting higher anxiety scores compared to those undergoing the second surgery.

Table 2: Association between Pre- op Information score and the sequence of cataract eye surgery (first versus second) among the study participants (n=75)

S.No	Variables	Mean $\pm$ SD	Mean difference	T value	p value
1.	<b>Pre- operative Information Score</b>				
	1 <sup>st</sup> cataract surgery	5.84 $\pm$ 1.41	1.493	8.615	0.028*
	2 <sup>nd</sup> cataract surgery	4.35 $\pm$ 1.36			

**\* P Value < 0.05 - Statistically significant at 95% Confidence Interval**

Table.2 shows the mean  $\pm$  standard deviation (SD) of preoperative anxiety scores for participants undergoing their first and second cataract surgery. The mean difference between the two groups is 1.493. The t-value of 8.615 with a p-value of 0.028\* indicates a statistically significant difference in preoperative information scores between the first and second cataract surgery groups. Participants undergoing the first surgery have higher information scores compared to those undergoing the second surgery.

Table 3: Association between post-op pain score and the sequence of cataract eye surgery (first versus second) among the study participants (n=75)

S.No	Variables	Mean $\pm$ SD	Mean difference	T value	p value
1.	<b>Post-operative pain score</b>				
	1 <sup>st</sup> cataract surgery	4.85 $\pm$ 1.07	-0.600	-3.243	0.002*
	2 <sup>nd</sup> cataract surgery	5.45 $\pm$ 1.26			

**\* P Value < 0.05 - Statistically significant at 95% Confidence Interval**

In Table.3 the mean difference between the two groups is -0.600. The t-value of -3.243 with a p-value of 0.002\* indicates a statistically significant difference in postoperative pain scores between the first and second cataract surgery groups. Participants who underwent the first cataract surgery reported lower postoperative pain scores compared to those who had the second cataract surgery.

Table 4: Association between post-op comfort score and the sequence of cataract eye surgery (first versus second) among the study participants (n=75)

S.No	Variables	Mean $\pm$ SD	Mean difference	T value	p value
1.	<b>Post-op comfort</b>				
	1 <sup>st</sup> cataract surgery	3.92 $\pm$ 0.85	0.373	2.216	0.030*
	2 <sup>nd</sup> cataract surgery	3.55 $\pm$ 0.94			

**\* P Value < 0.05 - Statistically significant at 95% Confidence Interval**

Table.4 shows mean difference between the two groups of 0.373. The t-value of 2.216 with a p-value of 0.030\* indicates a statistically significant difference in postoperative comfort scores between the first and second cataract surgery groups. The positive mean difference (0.373) suggests that participants who underwent the first cataract surgery reported, on average, higher postoperative comfort scores compared to those who had the second cataract surgery.

Table 5: Association between AC cell count and the sequence of cataract eye surgery (first versus second) among the study participants (n=75)

S.No	Variables	Mean $\pm$ SD	Mean difference	T value	p value
1.	<b>AC cells</b>				
	1 <sup>st</sup> cataract surgery	1.67 $\pm$ 0.70	-0.493	-6.235	0.006*
	2 <sup>nd</sup> cataract surgery	2.16 $\pm$ 0.67			

**\* P Value < 0.05 - Statistically significant at 95% Confidence Interval**

The mean difference between the two groups is -0.493. The t-value of -6.235 with a p-value of 0.006\* indicates a statistically significant difference in AC cell counts between the first and second cataract surgery groups. It can be inferred that AC cell counts increase in subsequent cataract surgery.

#### 4. Discussion

The present study investigated the association between the sequence of cataract eye surgery (first versus second) and various outcome measures, including preoperative anxiety, postoperative pain, postoperative comfort, and anterior chamber (AC) cell count. The demographic details revealed a mean age of 60  $\pm$  8 years, with a female preponderance of 58.3% and males at 41.3%. Notably, the study found a statistically significant difference in preoperative anxiety scores between the first and second cataract surgeries, with higher anxiety observed in participants undergoing the initial surgery. Similarly, preoperative information

scores were higher for the first surgery, indicating increased anxiety and information needs in the preoperative period.

Comparing these findings with the literature, the study aligns with the results of Akoglu CA et al.,<sup>15</sup> who reported higher state anxiety levels in the preoperative period of the first eye surgery compared to the second eye surgery. Similarly, Jiang L et al.<sup>11</sup> found that patients undergoing second-eye surgery reported higher pain scores during the perioperative period. The present study's results on postoperative pain are consistent with findings from Shi C et al.,<sup>16</sup> showing lower pain scores shortly after surgery in the first eye compared to the second eye. Additionally, Sharma NS ET al.<sup>17</sup> and Ursea R et al.<sup>18</sup> found no significant differences in pain scores between the two surgeries.

Interestingly, the present study also explored postoperative comfort, revealing higher comfort scores for participants undergoing the first cataract surgery. This aspect was not extensively covered in the literature reviewed, highlighting a potential contribution to the understanding of patient experience in sequential cataract surgeries.

It is noteworthy that the present study provides a comprehensive investigation into various aspects, including preoperative anxiety, preoperative information, postoperative pain, postoperative comfort, and AC cell count, contributing valuable insights to the existing literature. The discrepancies in findings across studies may be attributed to differences in methodologies, sample sizes, and cultural variations, underscoring the need for further research to enhance our understanding of the psychological and physiological factors influencing patient experiences in sequential cataract surgeries.

## 5. Conclusion

These findings contribute valuable insights into the psychological and physiological aspects of sequential cataract surgeries. The study suggests that patients may experience elevated anxiety and information needs before their initial surgery, while subsequent surgeries may be associated with increased pain perception and decreased comfort. The observed rise in AC cell counts during subsequent surgeries warrants further investigation.

Understanding these nuances in patient experiences during sequential cataract surgeries is essential for optimising preoperative preparation, enhancing patient satisfaction, and informing clinical practices. Further research is recommended to explore the multifaceted factors influencing these outcomes and to develop tailored interventions for improving the overall surgical experience for cataract patients undergoing multiple procedures.

**Conflict of Interest:** Nil

**Acknowledgements:** Nil

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