ISSN (O): 2581-8740 | ISSN (P): 2581-8732
Das *et al.*, 2022
DOI: 10.21276/SSR-IIJLS.2022.8.3.5

Research Article

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Study on Evaluation of Anaesthetic Pain Management in Day Care Surgery

Soumee Das[1*], Uday Kumar Panigrahi[2], Atreyee Choudhuri[3], Jyothsna Volisha Cardoza[4], Firdoos Jaman[5], Huba Khamis Rashid[6]

[1]Postgraduate Student, Department of Obstetrics and Gynaecology, Dali University, Yunnan, China
[2]Molecular Scientist, Quantum Speciality Diagnostics, Andhra Pradesh, India
[3]Independent Researcher, West Bengal, India
[4]Assistant Professor, Krupanidhi College of physiotherapy, Bangalore, India
[5]Regional Institute of Paramedical and Nursing Sciences, Aizawl, Mizoram, India
[6]Assistant Lecturer, Assistance Coordinator unit of Clinical Medicine, School of Health and Medical Sciences, State University of Zanzibar, Zanzibar, Tanzania

***Address for Correspondence:** Dr. Soumee Das, Postgraduate Student, Department of Obstetrics and Gynaecology, Dali University, Yunnan, China
E-mail: medblog18@rediffmail.com

Received: 05 Nov 2021/ Revised: 09 Feb 2022/ Accepted: 11 Apr 2022

ABSTRACT

Background: Daycare surgeries are those surgical procedures in which the patients are admitted and discharged on the same day. As daycare surgeries surged, there is a need to have an anaesthetic agent which can be efficient and also causes fewer side effects. This study effectively analyses the efficacy and safety profile of the two most popular anaesthetic agents used in daycare surgeries.

Methods: This is a retrospective study that was conducted between January 2022 and March 2022. The included patients were between 25 years and 65 years old. The outcomes were based on several factors like the efficacy of the anaesthesia (based on 4-point scale, recovery time and appearance of any side effects.

Results: The efficacy of the anaesthetic action was assessed by the 4-point scale of anaesthetic effect, which showed a better outcome with sevoflurane. The Recovery Time in Group 1 was 19.92±3.24 minutes while in Group 2 it was 25.04±3.03 minutes. The findings reveal that the numbers of patients with complications are more in Group 1 as compared to Group 2 patients.

Conclusion: Daycare surgery has increased and so, there is need to find an anesthetic agent which can efficiently be used. Anaesthetic efficiency is quite higher in sevoflurane as compared to desflurane. In the case of each complication, sevoflurane proved to have lesser complications as compared to desflurane. Sevoflurane is a better alternative to desflurane in daycare surgery as the anaesthetic agent of choice.

Key-words: Anaesthesia, Daycare surgery, Desflurane, Sevoflurane

INTRODUCTION

Daycare surgeries are those surgical procedures in which the patients are admitted and discharged on the same day. According to the British Association, there are over 200 surgeries that can be considered to be daycare surgeries. In recent times, there has been an increase in the number of surgeries in the daycare category [1]. With the increase in daycare surgeries, several aspects become important to be considered by the hospital including anaesthetic management. However, the types of surgery, the age of the patient and the expected outcome of the patient come into play in daycare surgeries [2]. With the increase in daycare surgeries, factors like safety and rapid recovery gained clinical importance so that the patient can be discharged the same day and experience no complications after going back [2,3]. In many cases, Post Operative Nausea and Vomiting (PONV) have been common complications in

How to cite this article
Das S, Panigrahi UK, Choudhuri A, Cardoza JV, Jaman F, et al. Study on Evaluation of Anaesthetic Pain Management in Day Care Surgery. SSR Inst. Int. J. Life Sci., 2022; 8(3): 3031-3035.

Access this article online
https://iijls.com/

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the pediatric population even after a single dose of anaesthesia. Anaesthetic agents that have a rapid onset, effective analgesic action and early recovery from anaesthetic effect are considered to be the agent of choice in daycare surgeries [3]. There is the advent of smooth and rapid anaesthetic agents also with much fewer side effects. Due to the introduction of inhalation anaesthetic agents meant for daycare surgeries, the complications like sore throat and damaged airways have been minimized [4].

It has been noted that post-discharge, the patient continues to experience post-operative pain. Hence the patients should be prescribed analgesic agents before discharge. Also, the daycare surgeries should be conducted on likely days like weekends [5]. Daycare surgeries have indications to be fulfilled like the age should be more than 5 years old, the patient should be physically fit and there should be no other underlying painful condition, motivated patients, etc [5].

In recent days, daycare surgeries are being performed as elective surgeries in USA and UK. However, there is a need for modern equipment and analgesic techniques. The development of acceptable practices is also necessary for daycare surgery [6]. This study effectively analyses the efficacy and safety profile of the two most popular anaesthetic agents used in daycare surgeries.

MATERIALS AND METHODS

This is a retrospective study that was conducted between January 2022 and March 2022. The study has been carried out on the Indian population in a private hospital at New Delhi, India.

Inclusion and Exclusion Criteria- The study considered 100 patients, who came to our hospital for daycare surgeries. The included patients were between 25 years and 65 years old. The patients included in this study had day-care surgery, cooperated with the hospital for follow-up information, and also provided consent for this study. The excluded patients were those who had underlying conditions, and uncooperative patients, who did not visit the doctor for follow-up.

Groupings- Out of 100 patients, due to several reasons, patients were given either sevoflurane or desflurane. Accordingly, the patients are classified into 2 Groups, namely, Group 1 patients, who were given sevoflurane and Group 2 patients, who were given desflurane.

The outcomes were based on several factors like the efficacy of the anaesthesia (based on a 4-point scale, recovery time and appearance of any side effects. The induction of the anaesthetic effect was done by propofol (1.5 to 2 mg/kg) followed by maintenance of anaesthetic action by using either sevoflurane or desflurane. The study has selected 50 patients in each Group for proper comparison of the effect of sevoflurane and desflurane.

Statistical Analysis- The data analysis was conducted in SPSS 25 and Excel software for statistical analysis. Other analyses have been conducted by determining the percentages and plotting graphs.

Ethical Approval- The study was ethically approved by the institute. The study was conducted according to the ethical guidelines mentioned in the Declaration of Helsinki developed by the World Medical Association (WMA).

RESULTS

The age of the patients in Group 1 and Group 2 are 45.54±12.01 years old and 44.54±11.65 years old. The male and female ratio in each Group was almost similar. Fig. 1 and Fig. 2 show the distribution of ages of the patients in each Group and the gender distribution of the patients in both Groups.

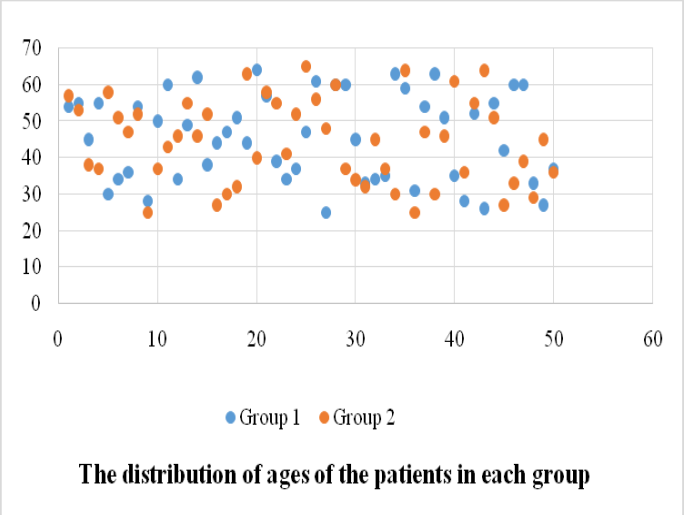

Fig. 1: Age distribution of the patients in Group 1 and Group 2

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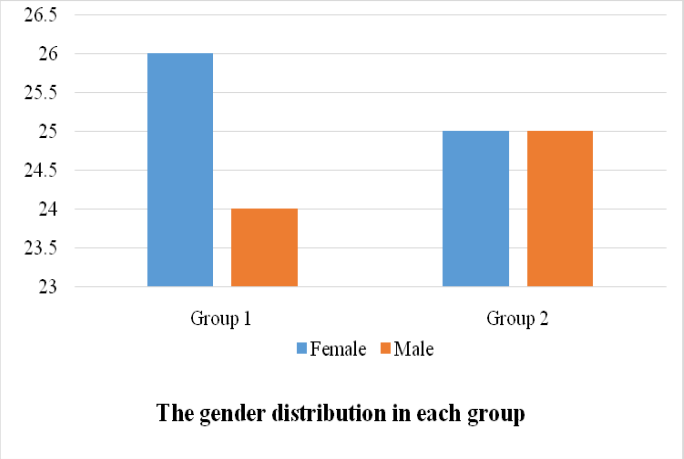

Fig. 2: Gender distribution of the patients in Group 1 and Group 2

The efficacy of the anaesthetic action was assessed by the 4-point scale of anaesthetic effect, which showed a better outcome with sevoflurane. In the 4-point scale, only "0" score is considered to be the most effective and the number of patients in each Group, who scored "0" is considered to have the best anaesthetic effect. Fig. 3 shows the anaesthetic efficacy between the two Groups.

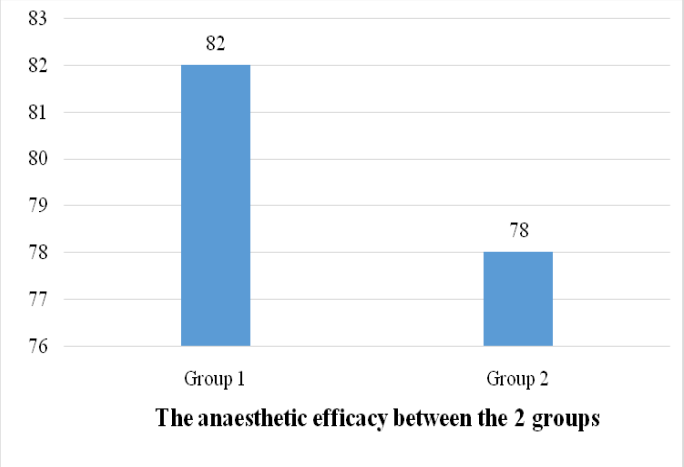

Fig. 3: Efficiency of the anaesthesia in Group 1 and Group 2

The Recovery Time in Group 1 was 19.92±3.24 minutes while in Group 2 it was 25.04±3.03 minutes. The Recovery Time is the time taken from the ending of the surgery to the disappearance of the anaesthetic action. Fig. 4 shows the recovery time needed by each case in each Group.

The complications that were found in the patients of this study were excessive secretions, mucus blockage, cough, reduced oxygenation and bronchospasm. The findings reveal that the numbers of patients with complications are more in Group 2 as compared to Group 1 patients. Fig. 5 shows that each complication was found lesser in Group 1 than Group 2.

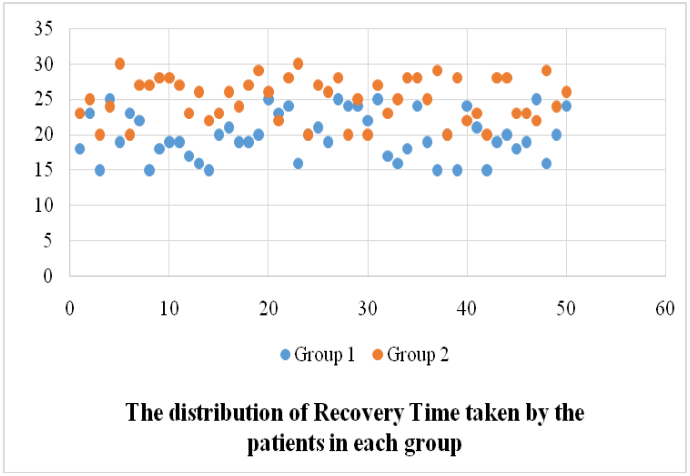

Fig. 4: Distribution of the Recovery Time taken by the patients in Group 1 and Group 2

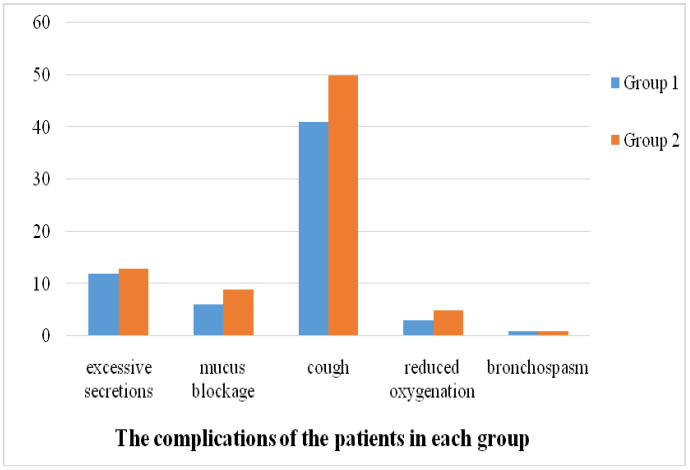

Fig. 5: Number of patients with respective complications in Group 1 and Group 2

DISCUSSION

There are several papers published which analysed the anaesthetic agents used in daycare surgeries. Several patient-controlled studies showed discussion on the route of anaesthetic agents and found intra-nasal and transdermal to be the most effective routes [7]. In our study sevoflurane is being administered via intra-nasal route and found to be efficient anaesthetic agent. As daycare surgery occurs on the same day of admittance and discharge, there is a need to find out the effective anaesthetic agent in terms of pain alleviation and minimized complications. This current study has shown that the recovery time of Sevoflurane was 19.92±3.24 minutes due to which, sevoflurane can be well considered to be an anaesthetic agent. Over 60% of surgeries are performed as daycare procedures in the

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USA and the majorities are performed in general surgery, otorhinolaryngology, ophthalmology, etc [8]. Another study discussed that there is a need for proper clinically proven guidelines to be followed in daycare surgeries, which should be formulated from the previous clinical studies, recommendations and clinical trials [9]. A study by Alfonso suggested creating an information management system may guide physicians and surgeons effective in daycare surgeries [10]. Avoiding postoperative pain and nausea or vomiting is one of the challenges. Postoperative pain may last for a few days but it needs to be reduced. In this current study, Figure 3 reveals the efficiency of the anaesthetic agent during the surgery and post-operatively, the pain does not persist for long. Even the anaesthetic effect disappears suitably and the patient can go back to his or her normal schedule. The objective of the day care surgery should make the patient go back to his or her routine as early as possible [11]. Another study discussed the cost-effectiveness of the day care surgery. Although the day care surgery needs a minimum workforce as the patient is admitted and discharged the same day, it needs sophisticated instruments and effective anaesthetic agents [12]. Studies have suggested avoiding general anaesthesia in day care surgeries. Patients with chronic obstructive diseases in the airway may have bronchospasm and same-day discharge may be fatal for them as the patients need to have monitoring if general anaesthesia is applied [13]. Although we found bronchospasm to be the least post-operative complication, the authors of this current manuscript suggest that the previous guideline of avoiding daycare surgery should be continue, until conducting specific study on larger population. Another study by Zaman *et al.* [14] showed that daycare ENT surgeries are safer as well, with efficient anaesthetic agent which later have resulted significantly reduced re-admission rates. It has been found that, among hospitalized patients, severe form of post-operative pain is common. In another study, daycare surgery was quite effective in breast carcinoma treatment and it was not replaced by radiotherapy. The patient's compliance was high and satisfactory. It was also reported that the patients also had reduced financial burden [15-18].

CONCLUSIONS

The patients anaesthetised with sevoflurane showed more efficacies in terms of pain management during and after the daycare surgery and especially the recovery time was shorter in the sevoflurane group of patients as compared to the desflurane group. The complications are lower in the sevoflurane group as well. Hence, sevoflurane is a better alternative to desflurane in daycare surgery as the anaesthetic agent of choice. One of the difficult points regarding daycare surgery was anaesthetic management and post-operative anaesthesia associated complications which are being addressed in this current study.

Hence, the current study concluded points which will be beneficial by better managing anaesthesia in daycare surgery. The authors can conduct so that the minimal complications like cough or post-operative re-admissions which still occur, can be reduced and more surgeries can be carried out as daycare ones, which will eventually increase patients' compliance and satisfaction.

CONTRIBUTION OF AUTHORS

Research concept- Soumee Das
Research design- Uday Kumar Panigrahi
Supervision- Firdoos Jaman
Materials- Jyothsna Volisha Cardoza
Data collection- Jyothsna Volisha Cardoza
Data analysis and Interpretation- Uday Kumar Panigrahi
Literature search- Huba Khamis Rashid
Writing article- Soumee Das
Critical review- Atreyee Choudhuri
Article editing- Atreyee Choudhuri
Final approval- Soumee Das

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