

Frequency and Outcomes of Day Case Surgery in Pediatric Surgical Patients

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ABSTRACT

Introduction: Day-case surgery refers to planned medical procedures where patients are admitted and discharged on the same day, requiring a period of recovery in the facility before they can safely return home. It is essential to note that even though patients are released on the same day, they may need some time within the facility for proper postoperative recovery. This study aimed to assess the frequency and outcomes of day-case surgery in pediatric surgical patients.

Methods: This prospective study was conducted in six months from July 2014 to December 2014. A total of 298 surgical operations were performed on infants and children in the Paediatric Surgery Department of BSMMU (Bangabandhu Sheikh Mujib Medical University) having optimum operating, anesthetic, and post-anesthetic recovery facilities. Among these patients, 103 patients were undergone as Day case Procedures. All data were collected using a pre-formed questionnaire. Collected data were analyzed using descriptive statistics. Analysis of data was carried out by using a statistical package for social science (SPSS) 22.0 for Windows. After analysis, the data were presented in tables and charts

Result: 39% of the total surgical operations were day-case surgery. On average, post-operatively, 87.3% required two doses of oral analgesia and did not require any special care and 29.1% returned to their normal activity on the next day. Post-surgical complications incidence was 3.6% among the <1 year and 8.6% among the >1 year age group and one patient was admitted to the hospital for a few days due to post-operative pneumonia. There were no deaths in the whole group. Most of the parents commented positively about fasting time, surgeon, anaesthetist, pain control, and cost but regretted about waiting room and waiting time.

Conclusion: Paediatric day surgery is being practiced safely and cost-effectively at BSMMU. Parents' overall perception of pediatric day-case surgery is good but some improvisation to reduce the waiting time and a comfortable waiting room is needed to provide better service.

KEYWORDS: Day Case Surgery, Pediatric, Anesthesia, Caregiver.

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INTRODUCTION

Day-case surgery refers to planned medical procedures where patients are admitted and discharged on the same day, requiring a period of recovery in the facility before they can safely return home. It is essential to note that even though patients are released on the same day, they may need some time within the facility for proper postoperative recovery. Procedures conducted in outpatient clinics or emergency departments are typically not classified as day-case surgery. Day-case surgery primarily involves elective and prearranged procedures, aiming to provide efficient and cost-effective care while ensuring that patients receive adequate postoperative monitoring and recovery assistance before being discharged. [1] The modality of the health care delivery system is changing day by day. Advancement of science and technology blessed medical science to a new standard. Surgery, the previous nightmare of the patient has become more patient-friendly and safe. Research is being carried out all over the world to make it more convenient. Along with the conventional inpatient and outpatient system, newer concepts, like Ambulatory surgery, Short-stay surgery, or Day case surgery have been allowed to grow and run parallel. [2] Day case surgery, ambulatory surgery, and outpatient surgery are used interchangeably to describe non-emergency surgery performed on carefully selected patients who are discharged home after recovery from anesthesia on the same day. [3] With the advancement of anesthesia, the scope of day-case surgery is increasing worldwide. Children are good candidates for Day surgery because they are relatively healthy, and the surgical procedures they require are generally predictable and often of short duration. [4] Moreover, lower costs reduced psychological trauma to both parents and children and rapid recuperation has made the Day Case Surgery more popular among pediatric surgical patients. Nowadays about 70-80 percent of paediatric operations are done as day cases internationally. [5]

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Careful patient selection is the key to successful daycare surgery. Selection is not only a matter of choosing patients with conditions that may be treated as a day case but also considering their medical and social reasons. The British Day Case operational guideline states a list of 25 operations that can be done as day cases. [6] But progressive modernization of surgery and anesthesia is giving us scope to explore more and more operations that can be done as day cases. Because of the economic inequality and the absence of strict laws and quality control, outpatient surgery in the Indian subcontinent is performed in chemists' shops, private clinics, nursing homes, primary health centers, civil hospitals, peripheral medical colleges as well as tertiary care centers. [7] However, no standard protocol for day-case surgery has been developed yet in our country. The Department of Paediatric Surgery, BSMMU took the initiative to develop and follow a standard protocol for pediatric day-case surgery. [8] Day-case surgery is being practiced in a limited manner in some other hospitals. We need to consider this approach on a wider scale as socio-economic limitations put restraints on our existing surgical healthcare delivery system. The present model study is based on the activity of the Department of Paediatric Surgery, BSMMU, in providing Day case surgery comparing it with the inpatient setting in this Hospital. The general objective of this study was to assess the frequency and outcomes of day-case surgery in pediatric surgical patients.

OBJECTIVE

General Objective

- To assess the frequency and outcomes of day-case surgery in pediatric surgical patients

Specific Objectives

- To observe the impact of day-case surgery among pediatric patients and their families.
- To analyze the type of operation among the pediatric population in day-case surgery.

METHODS

This prospective study was conducted in a monthly period from July 2014 to December 2014. A total of 298 surgical operations were performed on infants and children in the Paediatric Surgery Department of BSMMU (Bangabandhu Sheikh Mujib Medical University) having optimum operating, anesthetic, and post-anesthetic recovery facilities. Among these patients, 103 patients were undergone as Day case Procedures.

Inclusion Criteria

- Patients have a competent relative or caregiver to look after him or her at home for the next 24-48 hrs.
- Patients whose residences are not far away from the hospital.
- Patients who were fit for general anesthesia according to ASA score.
- Patients with no other pathology/co-morbidity.
- Psychologically stable patients.
- Patients who were willing to give consent.

Exclusion Criteria

- Patients with severe respiratory illness, cardiac disease, or congenital malformation
- Patients whose parents were not willing to participate in the study.

Preoperative starvation was kept to a minimum to prevent hypoglycemia. No premedication was administered. General anesthesia was administered to all the patients by the pediatric anesthetist. The induction was carried out either by intravenous thiopentone sodium or with halothane delivered via a facemask depending upon the effect of pre-medication. Maintenance therapy consisted of halothane, nitrous oxide, and oxygen administered through a facemask. Endotracheal intubation was performed only for specific indications. e.g. long procedures, operations of the head and neck, and when there was difficulty in maintaining an adequate airway. The same surgical team carried out all the operations with different sets of anesthetists. Following the operation, all patients were kept in the recovery room under observation. All data were collected using a pre-formed questionnaire. Collected data were analyzed using descriptive statistics. Analysis of data was carried out by using a statistical package for social science (SPSS) 22.0 for Windows. After analysis, the data were presented in tables and charts. Ethical clearance was taken from the ethical committee of BSMMU. Informed written consent was obtained from the participants.

RESULTS

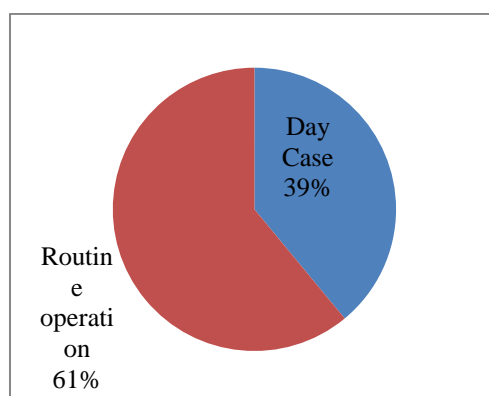


Figure 1: Day Case Surgery Ratio

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In six months a total of 298 patients were operated on in Pediatric Surgery Department. Among these operations, 103 surgical procedures were performed as day cases representing 39% of the total surgical operations. [Figure 1]

Table 1: Age and sex distribution of patients

Age group	Male	Female	Total	%	Male: female
0-5 years	33	20	53	51.45	1.8: 1
5-10 years	22	14	36	34.9	
10-15 years	11	3	14	13.5	

SD-3.3

The youngest patient was 18 days old and the oldest was 14 years old. The median age was 4.5 years with a standard deviation of 3.3 years. Males dominated over the females with a ratio of 1.8:1. [Table 1]

Table 2: Monthly income of the head of the family

Monthly income	No of family	%
<10,000	58	56.4
10,000-20,000	33	32.0
> 20,000	12	11.6

Majority of patients (56.4%) came from low socio-economic conditions while 11.6% came from high socio-economic status. [Table 2]

Table 3: Educational status of primary caregiver

Education	No of caregiver	%
Below primary	35	33.9
Primary	31	30.1
Secondary	20	19.4
Higher	17	16.6

64% of mothers or primary caregivers of the child have the educational status of primary or below primary level and only 16.6% crossed the higher secondary level. [Table 3]

Table 4: Types of operations

Operation	n	%
Inguinal herniotomy	19	18.4
Sclerotherapy for haemangiomas	16	15.5
Rectal polypectomy	15	14.5
Excision of dermoid	13	12.6
Circumcision	7	6.8
Frenulectomy	7	6.8
Rectal biopsy	7	6.8
Excision of lipoma	3	2.9
Lymph node biopsy	2	1.9
Excision of sebaceous cyst	2	1.9
Cystoscopy	2	1.9
Orchidopexy	2	1.9
V-P shunt removal	2	1.9
Meatotomy	2	1.9
Thiersch operation	2	1.9
Umbilical hernia repair	2	1.9
Total	103	100

The variety of surgical procedures are enlisted in Table 5. Here we see that the inguinal herniotomy has topped the list (18.4%) among all procedures. [Table 4]

Table 5: Post-operative events at home & management

Post-operative behavior	n	%	Remarks
Pain	90	87.3	Oral analgesics
Vomiting	10	9.7	No treatment required
Fever	13	12.6	Oral antipyretic
Feeding disturbance	20	19.4	No treatment required
Drowsiness and general anxiety	25	24.2	No treatment required

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Sore throat	8	7.7	No treatment required
Same day ambulation	30	29.1	

All these were managed by their parents satisfactorily concerning feeding, pain, and routine activities. Only 17% of parents called one of the surgeons on the telephone to inquire about their apprehensions at home and all were explained and satisfied. On average, post-operatively, 87.3% required two doses of oral analgesia and did not require any special care and 29.1% returned to their normal activity on the next day. [Table 5]

Table 6: Post-operative complications

Complications	n	%
Wound infection	1	0.9
Hematoma	1	0.9
Bleeding	1	0.9
Pneumonia	1	0.9
Total	4	3.6

Post-surgical complications incidence was 3.6% among the <1 year and 8.6% among the >1 year age group and one patient was admitted to the hospital for a few days due to post-operative pneumonia. There were no deaths in the whole group. [Table 6]

Table 7: Waiting time from first visit up to operation date

Waiting time	n	%
1-2 weeks	45	43.7
2-4 weeks	56	54.4
>4 weeks	2	1.9

The majority of the patients (54.4%) got operated on within 2-4 weeks after their first visit to the outpatient Department Average waiting time was 20 days with a standard deviation (SD) of 6.2 days. [Table 7]

Table 8: Parents' perception about different steps of day Surgery at BSMMU

Questions	Satisfied	Good	Average	Not good	Unsatisfied
Waiting time	12	32	27	17	15
Waiting room	0	0	10	90	3
Fasting time	3	79	6	13	2
Surgeon	13	37	53	0	0
Anesthetist	11	32	53	7	0
Nursing	8	66	22	7	0
Pain control	12	38	50	2	1
Costing	0	66	37	0	0
Follow up	0	58	39	2	4
Overall score	59(6.4%)	408(44%)	297(32%)	138(14.9%)	25(2.7%)

The acceptance of the outpatient procedure for their children by parents was encouraging as the daily family routine was minimally disrupted. 44% thought it was good but needed some improvements regarding the waiting room and waiting time. 6.4% of parents were satisfied and appreciated this approach of surgical management while 2.7% of parents made few adverse comments which included difficulty in transportation, post-operative pain and vomiting, and apprehension regarding the management at home of small kids, which they thought to be better managed as inpatient. [Table 8]

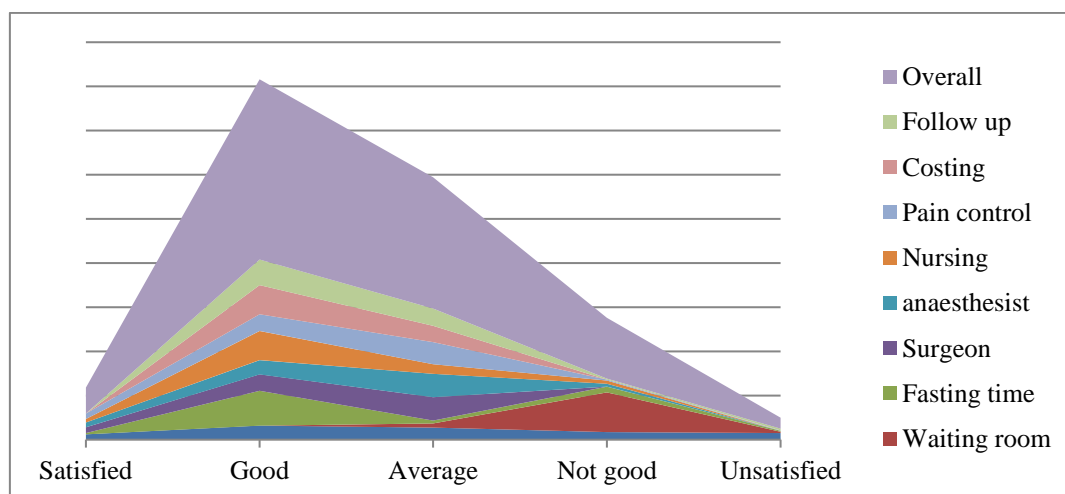


Figure 2: Perception Graph of parents about day case surgery

Figure 2 depicts the overall attitude of the parents about the daycare policy. Most of them commented positively about fasting time, surgeon, anaesthetist, pain control, and cost but regret about waiting room and waiting time. [Figure 2]

DISCUSSION

The context of Bangladesh is different from those of the developed countries in terms of infrastructure of the health care delivery system, communication and transport facilities, and most importantly the economic and educational indigence of the majority of the population. [8] But many other developing countries like Nigeria, Pakistan, and India have already adopted the day case delivery system in their hospitals and they proved that it did not create any further burden on their economy and manpower. [9-11] In contrast, we have not yet popularised day-case surgery among the patients as well as our surgical caregivers, especially in pediatric surgical cases. This is the reason to undertake this model study. In our study, we succeeded in performing 103-day case procedures in pediatric patients which is about 39% of total pediatric surgery in this period. The percentage of day cases is comparatively less than in other studies [12-17] but we have the facility of only one day in a week for day cases. So, the percentage is satisfactory enough. The present study has revealed a preponderance of the age group 0-5 years. Fifty-one percent in the day case series have fallen in this group. This is higher than 50% of the series of Robinson et al. In a previous Dhaka-based study by Ahmed MZ, among 19 pediatric patients, only 31% fell in this group. [9] In our study, the lowest age was 18 days and our observation corresponds with those of Stiff et al. [10] The sex ratio is also higher at 1.8:1 for males in the day case series and this is in line with common trends. Ahmed A.F.K.U. observed the male dominance was about 4:1 in pediatric day cases in this hospital. [8] The reason is obvious in our male-dominant socioeconomic condition but the scenario has changed enough. In the case of assessing socioeconomic status, we have taken into account the average monthly income of the head of the family. We observed that 56.4% of patients came from low socioeconomic status while only 11.6% came from higher status. This represents the socioeconomic status of our country. Socioeconomic and intelligence status are also important as they relate to the easy home convalescence. [8] We found majority of mothers (33.9%) had an education below primary level but they managed their child at home very easily. So, patient care by a mother of average intelligence is sufficient for easy convalescence, which is supported by Erden et al [18] and Hallstrom et al. [19] In our study we observed that 66.1% of parents were educated. This indicates that the day case strategy is gaining popularity among the educated population in our country. Among 103 cases we have done a variety of operations. We observed that herniotomy was the most frequent operation (18.4%) done in our day case series followed by Sclerotherapy of Haemangiomas (15.5%), rectal polypectomy (14.5%), and excision of dermoid (12.6%). Previous two studies by Ahmed FK and Ahmed ZA in our country also support these findings. [8,9] Circumcision, frenulectomy, and rectal biopsy each constitute about 6.8% of all cases. We have also performed Orchidopexy (1.9%), lymph node biopsy (1.9%), excision of lipoma (1.9%) and sebaceous cyst (1.9%), removal of V-P shunt (1.9%), Cystoscopy (1.9%), Thiersch operation (1.9%), Umbilical hernia repair (1.9%), and meatotomy (1.9%). The percentages varied from other studies as stated by the Royal College of Surgeons of England in their Day Case Guidelines. [20] We have also observed in our model study that there have been no major complications. Letts et al. [4] observed in their series of 4,899 cases, a complication rate of 3.6 % while Calder et al. observed in their series, 0.87 % complications carried out in a dedicated day care center. We have come across 1 complication which constitutes 0.9% which is almost similar to the series of Calder et al. [11] We have not found any increase in post-operative complications in our patients. Superficial wound infection was seen in 3 cases, hematoma occurred in 3 cases and 2 patients bled moderately from the skin edges under dressing. However, no further intervention was required for any case. The wound infection rate of 2.8% for our series is very comparable with other similar studies [15] and also the overall post-surgical complication rate of 8.3% does not exceed if compared with the studies for hospitalized patients. [16,17] This is due to our careful selection of cases and detailed briefing of parents before surgery. We also observed minimal disruption of the daily routine of families due to short hospital stays. Assessment of parents' attitudes towards day-case surgery is troublesome work. We had prepared a questionnaire following that of Erden et al. [18] We inquired about the parents on the second visit or over the telephone on a third postoperative day about their attitude towards the day case system. We graded their opinions in five categories about waiting time, waiting room facilities, fasting time of the child, service regarding surgeons, anesthetists, nursing staff, pain management, overall expenditure, and follow-up as shown by Erden et. al. We observed a majority of their opinion was good (44%) but some shared bad experiences regarding waiting time and waiting room.

LIMITATIONS OF THE STUDY

The effectiveness of pediatric day-case surgery in our socioeconomic condition can not be assumed properly by a single institution-based study. Late complications of the operative procedures done in the study could not be evaluated. Cost-effectiveness was assumed on an average basis almost hypothetically. So, it could be over-estimated.

CONCLUSION

Pediatric day surgery is being practiced safely and cost-effectively at BSMMU. Parents' overall perception of pediatric day-case surgery is good but some improvisation to reduce the waiting time and a comfortable waiting room is needed to provide better service.

RECOMMENDATION

There is a need to provide guidelines for Day Case practices that will set in motion the emergence of freestanding units soon while keeping in view the prospects of the day case surgical offices. Our hospitals and health ministry should be encouraged to invest in day-case practice by sponsoring the establishment of hospital-autonomous facilities. As efforts are being directed at curtailing the menace of Malaria, HIV/AIDS, Tuberculosis, Child & Maternal health, and other communicable diseases, other promising aspects

of the health sector like day case practice should not be neglected. Other centers not currently practicing DCS should be encouraged to do so.

CONFLICT OF INTEREST: None declared

ETHICAL APPROVAL: The study was approved by the Institutional Ethics Committee

REFERENCES

- 1) Emeka CK, Ikemefuna OI, Chukwuebuka NO. Paediatric Day Case Surgical Practice at a Tertiary Hospital in Enugu, Nigeria. *American Journal of Pediatrics*. 2019;5(4):214-8.
- 2) Verma, R., Alladi, R., Jackson, I., Johnston, I., Kumar, C., Page, R., et al., (2011) Day case and short stay surgery: 2, Anaesthesia. *Journal of the Association of Anaesthetists of Great Britain and Ireland*, 66, 417- 34.
- 3) Scarlett, M., Crawford-Sykes, A., Thomas, M., Duncan, N.D., (2007) Paediatric Day Surgery: Revisiting the University Hospital of the West Indies Experience. *West Indian Medical Journal*, 56 (4), 320-5.
- 4) Letts, M., Davidson, D., Splinter, W., Conway, P., (2001) Analysis of the efficacy of pediatric day surgery. *Canadian Journal of Surgery*, 44 (3), 193-8.
- 5) Adyanthaya, K., (2007) Paediatric Surgery as Day-case, *Day Surgery Journal of India*, (3), 31-33.
- 6) Castoro, C., Bertinato, L., Baccaglini, U., Drace, C.A., McKee, M., (2007) Policy Brief. Day Surgery: Making it Happen. WHO on behalf of the European Observatory on Health Systems and Policies. Brussels, Belgium.
- 7) Jyotsna, W., (2005) The current status of day care surgery. A review. *Indian Journal of Anaesthesia*, 49 (6), 459-66.
- 8) Ahmed, A.F.K.U., (1990) Prospects of Day Care Surgery in Children under general anesthesia in Bangladesh: A model study on inguino-scrotal swellings. Dissertation (FCPS). Bangladesh College of Physicians & Surgeons.
- 9) Ahmed, M.Z., (1997) Day Care Surgery in Bangladesh: A Dhaka-based study. Dissertation (FCPS). Bangladesh College of Physicians & Surgeons.
- 10) Stiff, G., Haray, P.N., Chilcott, M., Williams, I., Watkins, G., Foster, M.E., (1996) Day case surgery in children under 2 years of age: experience in a district general hospital and survey of parental satisfaction. *Journal of Royal College of Surgeons of Edinburgh*, 41(12), p408-11.
- 11) Calder, F., Hurley, P., Fernandez, C., (2001) Paediatric day-case surgery in a district general hospital: a safe option in a dedicated unit. *Annals of Royal College of Surgery England*, 83, 54-7.
- 12) [Rahman](#), L.O.A., [Kolawole](#), I.K., [Adeniran](#), J.O., [Nasir](#), A.A., [Taiwo](#), J.O., [Odi](#), T. (2009) Pediatric day case surgery: Experience from a tertiary health institution in Nigeria. *Annals of African Medicine*, 8 (3), 163-7.
- 13) Usang, U.E., Sowande, O.A., Ademuyiwa, A.O., Bakare, T.I.B., Adejuyigbe, O., (2009) Day case surgery in Nigerian children: Influence of social circumstances of patients. *Annals of African Medicine*, 8 (1), 42 – 5.
- 14) Agbakwuru, E. A., Faponle, A. F., Adesunkanmi, A.R.K., Ogundoyin, O., (2001) Practice And Acceptance Of Day-Care Surgery In A Semi-Urban Nigerian Hospital. *East African Medical Journal*, 78 (4), 170-3.
- 15) Mandhan, P., Shah, A., Khan, A.W., Hasan, N., Uddin, M., (2000) Outpatient Paediatric Surgery In A Developing Country. *Journal of Pakistan Medical Association*, 50, (220), 122-8.
- 16) Elebute, O.A., Ademuyiwa, A.O., Bode, C.O., Idiodi-Thomas, H.O.I., (2014) Paediatric Day Case Surgical Practice at a Tertiary Hospital in Lagos: How have we fared? *Annals of Medical and Health Sciences Research*, 4(4), p 112-4.
- 17) Roberts L., (2006) Day Surgery- National and International From Past to the Future. *Journal of Ambulatory Surgery*, 12 (002), 143-5.
- 18) Erden, I.A., Pamuk, A.G., Ocal, T., Aypar, U., (2006) Parental Satisfaction with Pediatric Day Case Surgery. *Middle East Journal of Anesthesia*, 18 (6), 1113-22.
- 19) Hallstrom, I.K., Norlund A., Malmfors G., (1998) Paediatric Day-Care Surgery Increased Parental Participation Reduces Costs. *European Journal Of Public Health*, 8 (3), 247-9.
- 20) The Royal College of Surgeons of England, (2013) Children's Surgery, Children's Surgical Forum, London: RCS, (PGI-212808).