

## POST-OPERATIVE SYMPTOMS AT HOME IN CHILDREN FOLLOWING DAY CASE SURGERY

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### Abstract

**Background:** This prospective questionnaire-based study examined the post-operative symptoms encountered by children who had day case surgery at a dedicated day case surgery unit. The study evaluated the post-operative symptoms at home. The parents also evaluated the instructions given in the hospital for care at home.

**Methods:** All children aged 1 day – 14 years operated over a one year period were prospectively followed up following elective day case surgery. The incidence and duration of symptoms were evaluated using a structured questionnaire completed by the parents. Also, the instructions given in hospital for care at home were evaluated by the parents using another questionnaire.

**Results:** A total of 100 children were operated during the period. Pain (72%), emetic symptoms (16%) and difficulty with walking (7%) were the commonest symptoms occurring on the way home. There were no unplanned admissions. Two thirds of the parents did not know enough of the treatment of the wound and of the overall recovery of the child.

**Conclusion:** Post operative symptoms following elective day case surgery are amenable to treatment and prevention with a wider use of available drugs for peri-operative analgesia.

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## **Introduction**

Day case surgery has become established in most hospitals all over the world. Safety, fast recovery, minimal post-operative symptoms, and available care at home, are important factors for consideration when selecting patients. In a previous study, we have established its practicality and acceptability in a semi-urban hospital<sup>1</sup>. However, few studies have evaluated the impact of patient reported symptoms after discharge from the post anaesthesia care unit. It is important to know the frequency of such symptoms so that providers can better inform patients, determine the extent of the problem and provide necessary perioperative interventions in order to reduce the impact of such patient related symptoms on functional recovery and health related quality of life.

For children, day case surgery is invariably appropriate because adults accompany them to the hospital. Children also depend on relatives for support and post operative care at home. Postoperative symptoms that develop, however, add to the burden of the relations of the sick child at home. This becomes very significant in developing countries where social, medical and nursing supports which are vital for necessary care at home, may be unavailable or inaccessible in many countries<sup>2,3</sup>. Their postoperative care at home is central to achieving complete recovery and ensuring that there are no unplanned readmissions to hospitals.

The prevention of complications following day case surgery is of utmost importance in order to make the procedure as safe and effective as it should be. Also, the concern for safety and comfort of the patients should extend beyond the recovery room to the ward and the home.

This study was undertaken to evaluate the incidence and duration of postoperative symptoms in children at home following day case surgery and anaesthesia. We also evaluated instructions given to parents in the hospital following surgery for care of the child at home.

## **Methods and Materials**

This study was carried out at the Day Case surgery unit of the Obafemi Awolowo University Teaching Hospital, Ile-Ife, Nigeria,

situated in a semi-urban part of south-western Nigeria.

All children aged 0-14 yrs operated between 1<sup>st</sup> April 2004 and 31<sup>st</sup> March 2005, were prospectively followed up. No changes were made to the unit routine because of the study. At the preoperative interview, the study was introduced to parents of children being booked for surgery and their consent obtained verbally.

Only patients assessed as ASA I and II with a minimum packed cell volume (PCV) of 30% were accepted for surgery. No sedative premedication was given.

The anesthetic technique was as determined by the attending anesthetist using either a general or regional anesthetic technique. General anesthesia was induced by the inhalation of nitrous oxide and halothane in oxygen via a facemask. Intravenous access was secured after loss of consciousness. Atropine 0.01 mg/kg was administered intravenously. Maintenance of anesthesia was achieved with spontaneous breathing of the induction mixture either through the facemask or endotracheal tube when indicated. Intra operative analgesia was given as intravenous dipyrone after induction of anesthesia.

Patients were transferred to the recovery room at the end of the surgery where they were monitored until fully awake. Details of the anesthetic technique were recorded and immediate postoperative complications or problems were noted before discharge. They were then reunited with their parents who were also given instructions on the postoperative care of the patient at home. Parents were to give regular doses of oral paracetamol at home for analgesia.

The parent and patients were seen at the surgical outpatient clinics 3-4 days after surgery (first post-operative visit) and on the 7<sup>th</sup>-9<sup>th</sup> postoperative days (second post-operative visit). Parents and patients were interviewed using a structured questionnaire about the operation generally, and specifically about postoperative symptoms. The symptoms sought for were: pain, nausea and vomiting, dizziness, headache, difficulty with walking or urination. The parents reported about the occurrence of these symptoms on the way home, and during the first and

second post-operative clinic visits.

Data on the child, operation, type of anesthetic and analgesic use as well as the progress of recovery were noted on a separate study form.

Parents also evaluated the instructions given in the hospital about the post-operative care of the patient using another structured questionnaire.

### Evaluations

The alternatives were no/yes or none/mild/severe. Standard pain scales, such as smiling and crying faces, could not be used for all the children expected to enter the survey since they are considered valid only for children aged 4 years and older<sup>4</sup>. As it was not possible to present one of the behavioural pain scales during the brief pre-operative interviews, evaluations were based on judgments of parents. The data were input on Epi-Info Version 1. The incidence of post-operative symptoms is expressed as percentages. The data on nausea and vomiting were combined to represent the total incidence of post-operative emetic symptoms.

### Results

There were 100 children, 84 males and 16 females. The mean age was 3.8 years  $\pm$  4.15 (range 1 day – 14 years). The age distribution is as shown in Table 1. Sixty-nine percent of the children were aged 4 years and below.

*Table 1*  
*Pediatric Day Surgery: Age distribution*  
(n = 100)

Age in Years	No. of Patients
$\leq$ 28 days	11
1 mth - < 11 mths	17
1-4 years	41
5-10 years	22
11 years +	9
Total	100 (100%)

The mean packed cell volume (PCV) was 32%. The mean duration of surgery was 40.24 minutes  $\pm$ 27.88 with a range of 5 minutes –42 minutes.

General anesthesia was administered in 89 cases and local anesthesia in 11 cases. Seven of the babies for circumcision had penile block and four others had wound infiltration with 2% xylocaine with adrenaline for hernia repair and release of labia adhesion.

The surgical procedures undertaken are as shown in Table 2. Seventy-nine percent of the cases done were of surgeries in the lower abdominal region.

*Table 2*  
*Pediatric Day Case Surgery: Surgical Procedures*

(n = 100)

Procedure	Frequency
Herniotomy	58
Circumcision	12
Orchidopexy	7
Excision Biopsy	10
Foreign Body (ear) removal	3
Release of labia adhesion	3
Umbilical herniorrhaphy	1
Auricular excision	2
Hydrocelectomy	2
Incisional biopsy	2
Total	100

The post-operative symptoms noted are as shown in Table 3. Pain, mostly described as mild, was the commonest symptom reported on the way home following surgery (72%). Other symptoms reported are: nausea/vomiting (16%), difficulty with walking (7%), dizziness (2%), tiredness (2%) headache (1%) and fever (1%). Recovery was described as satisfactory in all cases. There was no unplanned admission as a result of complications.

*Table 3*  
*Postoperative Symptoms at Home following Day Case Surgery*  
Post-operative Days

Symptom	Day 0 (way home)	1 <sup>st</sup> follow-up day (day 3-4)	2 <sup>nd</sup> follow-up day (Day 7)
Pain (mild)	67	2	0
Pain (severe)	5	0	0
Vomiting/Nausea	16	0	0
Headache	2	0	0
Tiredness	2	0	0
Difficulty in walking	7	0	0
Fever	1	0	0
Dizziness	2	0	0

Table 4 shows the occurrence of symptoms following different operations on the way home following surgery as well as on the first and second post-operative visits.

### **Evaluation of Post-Operative Instructions**

Sixty seven parents did not know enough of the treatment of the wound (if any). Sixty-five parents did not know about the overall recovery of the child. Thirty-five claimed not to know about the treatment of the pain. Even though they had all been told to come back to the hospital if there was any problem, four parents sought for advice from private hospitals and chemists for various reasons such as vomiting<sup>1</sup>, not sure of how to care for the baby<sup>2</sup>, and not instructed on how to care for the baby<sup>1</sup>. A parent purchased antibiotics from a chemist because “she felt the baby needed it”.

### **Discussion**

The study indicates that post-operative symptoms that occur following day case surgery in this hospital are usually minor, amenable to prevention and can usually be treated at home. Majority of the parents reported that they were satisfied with their children’s recovery though only a third knew enough of the overall recovery.

*Table 4*  
*The occurrence of symptoms following various operations*

Type of Operation (Total Nos. of Case)	Symptoms (Day 0)						Day 1		Day 7
	Pain	Vomiting	Dizziness	Headache	Difficulty In Walking	Fever	Pain	Vomiting	
Hemiotomy (58)	44	9	1	1	5	1	1	-	-
Circumcision (12)	12	1	-	-	-	-	-	-	-
Orchidopexy (7)	3	1	-	-	2	-	-	-	-
Excision biopsy (10)	6	1	-	-	-	-	-	-	-
Incisional biopsy (2)	1	1	-	-	-	-	-	-	-
Release of labial Adhesion (3)	3	1	-	-	-	-	-	-	-
Umbilical herniorrhaphy (1)	1	1	-	-	-	-	1	-	-
Auricular Excision (2)	1	-	-	1	-	-	1	-	-
Hydrocoelectomy (2)	1	1	-	-	-	-	-	-	-
Total (100)	72 (72)	16 (16)	1 (1)	2 (2)	7 (7)	1 (1)	2 (2)	-	-

Pain and emetic symptoms were the commonest symptoms noted. In a similar study in Canada, incisional pain (26.9%), headache (11.6%) and drowsiness were the most frequently reported symptoms<sup>4</sup>. In that study, pain, nausea/vomiting, drowsiness, dizziness and headache were the most frequent postoperative symptoms after ambulatory surgery and their incidence was influenced by the type of surgical procedure. These factors also determined the degree of return to daily living function<sup>5</sup>.

Pain in the post-operative period should be actively prevented because of the increased morbidity with which it has been associated<sup>6</sup>. Fretfulness, restlessness, nausea and vomiting occur more in patients in pain. Also, the child in severe pain will awaken sooner and will have a poor quality of recovery. Simple analgesics such as acetaminophen and dipyrone via appropriate routes have been shown to be effective in treating such pain<sup>6</sup>. The use of opiates in treating severe pain particularly in extensive surgery may indicate the need to admit the child following surgery.

*Table 5*  
*Evaluation of instructions for post-operative care*

(n = 100)

1. Do you know enough about the treatment of the wound?		
Yes		33
No		67
2. Do you know how to treat the pain?		
Yes		65
No		35
3. Do you know enough of the overall recovery of the child?		
Yes		35
No		65
4. Did you ask for advice from other hospitals/clinics others, after discharge?		
Yes		4
No		96

Reasons

- \* Because of vomiting 1
- \* Not sure of how to care for him 2
- \* Not instructed 1

Regional analgesia with spinal, caudal or lumbar epidural block are appropriate techniques in pediatric anesthesia and should be used when the operative site is suitable. Regional blocks with long acting local anesthetics such as bupivacaine have been shown to be useful in post operative pain control<sup>7</sup>. A greater proportion of the patients operated in our study would have benefited from these procedures as they were surgeries that were amenable to the techniques. This would have resulted in lower pain scores than what was obtained here.

Oral paracetamol was prescribed for post-operative pain treatment in this study. Paracetamol suppositories, with parental consent, inserted in the immediate recovery period will also provide analgesia. It has been shown that pain in children who have undergone herniotomy can be treated adequately with paracetamol alone<sup>8</sup>. As found in this study, pain in the majority of children is not prolonged. For those with severe pain, it may be appropriate to prescribe oral opioid such as codeine or a non-steroidal anti-inflammatory drug to supplement simple analgesics. Non-steroidal anti-inflammatory drugs may cause gastric irritation orally and are painful on intramuscular injection but can also be given as suppositories. Opiates, e.g. morphine are best avoided because of the risk of post operative emesis although short acting opiates, e.g. alfentanil, can be used intraoperatively when local blocks are not performed<sup>9</sup>.

Severe immediate post-operative emesis has in some studies led to retention and readmission of day case children in hospital<sup>10,11</sup>, but this was not found in our study. Sixteen per cent of our patients were reported to have vomited at home but none was brought back to the hospital on account of this. Vomiting in this series is higher than the 12.2% reported in a similar study in Nigeria<sup>6</sup>. Vomiting is common in some patients who are predisposed. It occurs more often with some anesthetic agents such as narcotic analgesics, ketamine, nitrous oxide, isoflurane and di-ethyl ether<sup>12</sup>. Vomiting may also complicate some surgical procedures such as strabismus surgery and orchidopexy in children<sup>11</sup>. This was, however, not the experience in this study as only 1 of 7 patients (14.3%) of the patients who had orchidopexy vomited postoperatively. We could not establish the particular cause of vomiting in our series although it may not be

unrelated to the high incidence of pain. The incidence of pain, nausea and vomiting, dizziness and headache after surgery has been found to be influenced by the type of surgical procedure<sup>5</sup>. A European study found a statistically significant relationship between pain and post-operative nausea and vomiting (PONV)<sup>13</sup>. Effective prevention of pain can be expected to reduce PONV as has been suggested by Andersen and Krogh<sup>14</sup> and this has been shown in adults given pethidine, ketorolac and a local anesthetic block before anesthesia<sup>15</sup>. As suggested by Kotiniemi and others<sup>13</sup>, we recommend that appropriate anti-emetic prophylaxis may need to be given to susceptible children, particularly those who vomit in hospital before going home. However, such patients may need to be observed for a longer period in the hospital before they are discharged.

Seven patients who had herniotomy and orchidopexy complained of difficulty in walking after surgery on the way home. This, however, did not persist till the following day. Difficulty with walking may be due to the inadequate analgesia as reflected in the results of this study.

Fever at home occurred in only one patient. Malaria is a common cause of fever in this area where the parasites are holoendemic. In a study of healthy children presenting for surgery in Ibadan, Nigeria, 42% of the children were found to be slide-positive for *P. falciparum*<sup>6</sup>. Post-operative fever can be attributed to various causes including inflammatory reaction to surgery and malaria which is endemic in Nigeria and one of the leading causes of morbidity and mortality in children. Children who develop fever after surgery should be brought back to the hospital for proper diagnosis and appropriate treatment. It is necessary to inform mothers about this symptom following day case surgery.

The results of our study may not reflect the practice in our country as a whole. Our unit is the first dedicated government owned Day Case Surgery Center in the country. The sample size is also small but it has provided us a marker for post operative symptoms at home. It will be further used to provide information to our patients and will be the basis for developing strategies for prevention in the hospital quality assurance meetings.

In conclusion, Day Case surgery patients have unique needs distinct from those of traditional long stay in-patients. Their post-operative needs at home are central to achieving complete recovery and ensuring that there are no unplanned readmissions to hospitals. Symptoms that develop can be minimized. A wider use of available drugs for peri-operative analgesia and the systematic prescription of take home analgesia should be emphasized. The need to return the child to the hospital for advice following the development of complications even before the date of clinic appointment should also be emphasized.

### **Aknowledgements**

We are grateful to the nursing staff of the Day Case Surgery Unit, Obafemi Awolowo University Teaching Hospital, Ile-Ife and to the surgeons who assisted in the collection of our data. We particularly adknowlege Dr. Augustine Agbakwuru who read through the manuscript.

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