

LAPAROSCOPIC CHOLECYSTECTOMY IN SICKLE CELL PATIENTS: A NONTRANSFUSIONAL PERIOPERATIVE MANAGEMENT.

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Abstract

Background: The objective of this study is to evaluate the outcome of novel perioperative management involving prophylactic antibiotic, Intra Venous fluids and Intermittent Nasal Oxygen and avoidance of preoperative blood transfusion for Laparoscopic Cholecystectomy.

Methods: A prospective study included all sickle cell disease (SCD) and trait patients who underwent Laparoscopic Cholecystectomy from January 2007 to August 2010 at Acharya Vinoba Bhave Rural Hospital, attached to Datta Meghe Institute of Medical sciences university, Sawangi, Wardha. India

Result: A total of 26 patients underwent Laparoscopic Cholecystectomy. There were two recorded episodes of acute painful crises and three patients had postoperative fever. There were no recorded episodes of Acute Chest syndrome.

Conclusion: Laparoscopic Cholecystectomy can be safely performed for sickle cell anemia (disease and trait) patients, without preoperative blood transfusion. A defined perioperative regimen including use of antibiotic, IV fluids and Intermittent Nasal Oxygenation for these patients helps to reduce SCD related complications.

Keywords: Laparoscopy, Cholecystectomy, Sickle Cell, Nontransfusion, Haemoglobinopathy.

Introduction

Sickle hemoglobin was first detected by Lehman and Cutbush in 1952 among the tribals from Nilgiris. During the last 54 years several groups of investigators conducted hospital based or epidemiological surveys in various ethnic group based on these surveys, prevalence of sickle cell disease is found to be 0-18% in north eastern India, 0-33% in western India, 22.5- 44.4% in central India and 1-40% in Southern India.[1]

Sickle Cell Haemoglobinopathy is a common genetic disorder which represents a major medical and surgical problem. It is characterized by chronic hemolytic anemia and vaso-occlusive crises (VOC), which can lead to widespread vascular occlusion by sickled red blood cells leading to multiple organ infarctions [2]. Affected individuals are at increased risk of developing cholelithiasis [3] cholecystectomy is the most common surgical procedure performed for these group of patients [4] Patients with symptomatic stones will certainly require surgery that may be associated with high morbidity and mortality as a result of perioperative and postoperative complication; mainly vaso-occlusive crises [5]

The introduction of minimally invasive surgery is believed to be associated with minimal risk to the patients due to its numerous advantages over conventional method regarding short duration of hospital stay with quicker recovery [6]

and sevenfold increase in the risk of morbidity was found in open group compared to the laparoscopic group [7]. Laparoscopic cholecystectomy resulted in a shorter hospital stay with fewer postoperative complications than open operation in patient with sickle cell disease and may be the procedure of choice in the treatment of cholelithiasis in such patients [8]. The purpose of this study is to evaluate the outcome of a nontransfusional perioperative management in patients with SCD undergoing Laparoscopic Cholecystectomy.

Methods

All SCD patients with gallstones underwent Laparoscopic cholecystectomy at Acharya Vinoba Bhave Rural Hospital, Sawangi (Meghe), Wardha from January 2007 to August 2010. The study was approved by the ethical committee of Datta Meghe Institute of Medical sciences University.

Patient's age (ranging between 12 yrs - 22 yrs). All the patients subjected to investigations (i.e. Haemogram, Liver Function Test mainly Serum Bilirubin, Ultrasonography/CT scan) and subjected to Preanesthetic check up (PAC). All the patients received intravenous fluid hydration with Ringerlactate and Normal Saline/DNS, hydration started preoperatively and continued postoperatively until resumption to full oral intake. Prophylactic antibiotic (cefuroxime 1.5 gm) were given intravenously with induction of anesthesia. All the patients were subjected to

general anesthesia except few (3 patients operated under epidural anesthesia).

Surgery was conducted by an experienced laparoscopic surgeon with an experience of 15 years. The operative time was estimated from insertion of Veress Needle to introduce pneumoperitoneum until the application of dressing. Intraoperatively and postoperatively all patients were monitored with pulse oximetry and care was taken to avoid hypoxemia, hypothermia, acidosis and hypercarbia. All the patients monitored with special attention to adequate hydration (2 L – 2.5 L IV fluids), Intermittent Nasal Oxygen and analgesic in the form of Diclofenac Sodium (Inj/Suppository) every 8 hourly for the first 24 hours and thereafter oral analgesic for 2days. Patients were discharged home, once they had fully recovered. They were followed up in outpatient clinic one week after discharge and monthly for 3 months.

Results

The series included 26 patients operated by the same surgeon. There were 17 females (65.39%) and 9 males (34.61%) in the ratio 1:2. The average age was 17.33 yrs (range 12 yrs - 26 yrs).

The type of sickle cell haemoglobinopathies found were 18 patients (SS) and 8 patients (AS). Indication for surgery was biliary colic in all the cases. Mean Hemoglobin was 6.8 gm/dL (range 6.3-9.8 gm/dL).

The mean operative time was 44 min (30-60 min). There was no conversion to open cholecystectomy. The postoperative complications were three cases of postoperative fever and two cases of vaso-occlusive crisis. Antibiotics were given only after signs of infections like fever. The mean postoperative hospital stay was 2.5 days (range 1 to 6 days) and there was no mortality reported in the present study.

Table I: Age wise distribution of patients

n=26

Age(yrs)	No. of patients	Percentage (%)
0-9	3	11.54
10-19	12	42.31
20-29	11	46.15

Table II: Distribution of patients according to Haemoglobin level

Haemoglobin level(gm/dL)	No. of patients	Percentage (%)
6-8	16	61.54
8-10	10	38.46
10-12	0	0.00

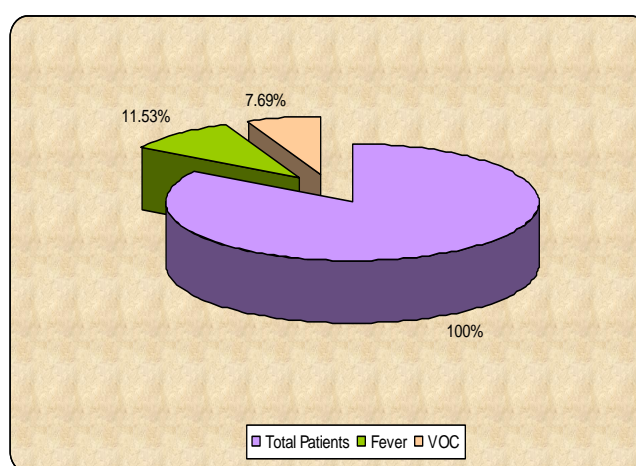


Figure 1: Postoperative Complications

Table III: Comparative studies of Laparoscopic Cholecystectomy in patients with sickle cell disease

Parameters	Ware et al (1992) Jr of paed	Mc Dermott et al (1993) Lancet	Tagget et al (1994) Jr of Paed Surg	Gode (2010) Present study
Number of pts	9	16	22	26
Age(yrs) Mean	13.3	24.0	13.0	17.33
Sex(Male/Female)	6/3	9/7	-	9/17
Mean Hb%	12.8 gm/dL	9.6 gm/dL	-	6.8 gm/dL
Blood Transfusion	3 patients	None	Some	None
Operative Time	45-120 min (mean 48)	35-112 (median 57)	60-312 (mean 144)	30-60 min (mean 44)
No of conversions	0	0	0	0
Morbidity	0	1 Atelectasis	1 Atelectasis 1 Arrhythmias	2 VOC
Mortality	None	None	None	None
Hospital Stay	1-3 days	1-5 days	-	1-5 days

Discussion

Preoperative Blood Transfusion in sickle cell patients undergoing any major surgery is controversial because most patients with SCD are chronically anaemic and develop compensatory mechanism to ensure reasonable functioning at low hemoglobin level.

In recent National Survey of practice in the United Kingdom, it was shown that most patients undergoing laparoscopic cholecystectomy do so without perioperative blood transfusion [9]. Further blood transfusion carries their own complications like transfusion related red cells allo-immunization and infection including the risk of Human Immunodeficiency virus (HIV) and Hepatitis-B.

Griffin et al in 1993 examined outcome in SCD [10] children undergoing surgical procedure without preoperative transfusion. There was no difference in the rate of complications in patients who received a transfusion and those who did not. Preoperative blood transfusion does not prevent perioperative complications, suggesting a growing trend to avoid transfusion when possible (11,12).

Present study conducted from January 2007 to August 2010 on 26 patients with sickle cell haemoglobinopathy who underwent Laparoscopic Cholecystectomy without preoperative blood transfusion.

The series included 26 patients operated by same surgeon. None of the patients received perioperative blood transfusion. Maximum numbers of patients were in the age group of 10-15 years (Table I), Mean hemoglobin level was 6.8 gm/dL (range 6.3 to 9.8 gm/dL). Most of the cases had Hb% level between 6-8 gm/dL (Table II) where as the mean hemoglobin range reported by various authors [9,10,11],(range 6.3-13.5 gm/dL). Mean operative time was 44 min (30-60 min). Majority of the patients in this study were admitted as emergency due to biliary colic (upper abdominal pain, nausea/vomiting). 8 patients had mild haemolytic jaundice (serum bilirubin (range 1.8 mg/dL-3.5 mg/dL). Postoperative complications noticed (Figure 1) were two patients with postoperative vaso-occlusive crisis managed by adequate hydration (2 to 2.5 L of IV fluids), analgesic and intermittent Nasal Oxygenation. Three patients had postoperative fever managed by paracetamol and Antibiotic. Table III shows comparative study of Laparoscopic Cholecystectomy by various authors Mean hemoglobin level was lowest (Hb% 6.8 gm/dL) in present study, mean operative time was 44 min. which is comparable to the study conducted by Ware et al(1992) (11). Morbidity reported by various authors was Atelectasis in one patient reported by Mc Dermatt et al (1993) (12). Similarly Tagget et al(1994) (13) reported Arrhythmias in one patient and Atelectasis in other patient. However in present study post operative fever was noticed in three and vaso-occlusive crisis in two patients.

Conclusion

Laparoscopic Cholecystectomy can be safely performed for patients with sickle cell haemoglobinopathies without prior blood transfusion. A defined peri-operative management including adequate fluid therapy, Intermittent oxygen and prophylactic antibiotics and multidisciplinary approach is required to optimize the outcome of surgery without major complications. Present study justified the non-transfusional perioperative management in patients with sickle cell disease undergoing laparoscopic cholecystectomy, which is superior to transfusion related risk in those patients receiving blood transfusion prior to surgery.

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