Original Article

Congenital Diaphragmatic Hernia in Children

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ABSTRACT

Objective: To study the presentation, results and complications of management of congenital diaphragmatic hernia in children at our setup.

Study Design: Retrospective Descriptive Study.

Place & Duration of Study: This study was conducted in the department of Paediatric Surgery, Children Hospital & The Institute of Child Health, Multan during a period of three years from January 2008 to December 2010.

Materials and Methods: A total of 25 patients with congenital diaphragmatic hernia were managed. Data was collected on the basis of history, clinical examination, relevant investigations, operative results and complications. Final analysis was made at the completion of study.

Results: Study included 25 consecutive cases with ages ranging from 12 hours to 7 months. 19 (76%) were male and 6 (24%) female. 20 (80%) were neonates with predominant symptoms of respiratory distress since birth along with cyanosis and apnoeic spells. Five (20%) patients were beyond the age of one month with predominant symptoms of recurrent respiratory tract infection, vomiting and failure to thrive. Clinical signs included absence of breath sounds, presence of bowel sounds and impaired resonance on affected side of chest in all 25 (100%) patients. Flat abdomen in 18 (72%) and cachexia in 2(8%). Left side involvement was in 22 (88%) and right side in 3 (12%). All the patients were operated upon. Conventional mechanical ventilation (CMV) was given to 16(64%). One (4%) patient died and rest of the 24(96%) survived.

Conclusion: Best possible operative results can be obtained with the help of limited facilities present in our setup.

Key words: Congenital diaphragmatic hernia, Ventilation, ECMO

INTRODUCTION

Congenital diaphragmatic hernia (CDH) is defect in diaphragm and protrusion of abdominal viscera through it into the thoracic cavity. Its etiology is still unknown[1]. CDH is a common surgical cause of severe respiratory distress in newborn. An infant born with CDH has high morbidity and mortality due to respiratory failure caused by pulmonary hypoplasia and persistent pulmonary hypertension[2-3]. Delayed surgery, respiratory support and extracorporeal membrane oxygenation in selected cases have improved survival in such cases[4-5]. In developing countries, patients of CDH who are critically ill or develop respiratory distress within 6 hours rarely reach specialized center. We usually receive those patients who have either survived the initial respiratory distress or develop the symptoms later on. This factor and the help of conventional mechanical ventilation have markedly improved the post operative survival of our patients[6-7]. In this study we report our experience of these cases.

MATERIALS AND METHODS

From Jan. 2008 to Dec. 2010, a study was conducted in the Department of Paediatric Surgery, Children Hospital & the Institute of Child Health, Multan on 25 patients with CDH. All the patients were admitted through emergency and OPD. Diagnosis was made on the basis of history and clinical examination. Investigations included CBC, serum electrolytes and X.ray chest with abdomen. Barium meal follow through was done in 5 cases. 20 neonate and 5 infants underwent surgery. Nasogastric tube passed before surgery. Subcostal incision was made in all cases. Herniated contents were reduced back into the abdominal cavity. Primary repair of defect in diaphragm was performed. A chest tube was placed and connected with underwater seal. Post operative care included antibiotics, IV fluid and analgesia. Conventional mechanical ventilation was given to the patients showing delayed recovery. Nasogastric and chest tubes were removed accordingly. Patients were discharged after removal of stitches about 10 days after surgery and follow up advised.

RESULTS

This study included 25 patients with ages ranging from 10 hours to 7 months. Five (20%) presented in first 24 hours, 6 (24%) in 48 hours, 5 (20%) in 72 hours, 4(16%) on 4th day of life, 2 (8%) at two months, 1 (4%) at 5 months and 2 (8%) at seven months of age. 19 (76%) were male and 6 (24%) female. 20 (80%) were neonates with predominant symptoms of respiratory distress since birth along with cyanosis and apnoeic

spells. Five (20%) patients were beyond the age of one month with predominant symptoms of recurrent respiratory tract infection, vomiting and failure to thrive. Clinical signs included absence of breath sounds, presence of bowel sounds and impaired resonance on affected side of chest in all 25 (100%) patients. Flat abdomen in 18 (72%) and cachexia in 2(8%). Left side involvement was in 22 (88%) and right side in 3(12%). All the patients were operated upon. Conventional mechanical ventilation (CMV) was given to 16(64%). Recurrence of hernia developed in 1(4%), wound infection in 2(8%). One (4%) patient died and rest of the 24(96%) survived.

Table No.1: Age at Presentation

Age	Number (Percentage)
24 hours	5 (20%)
48 hours	6 (24%)
72 hours	5 (20%)
4 day	4 (16%)
2 months	2(8%)
5 months	1(4%)
7 months	2(8%)
Total	25(100%)

Table No.2: Complications

Complications	Number (Percentage)
Recurrence	1(4%)
Wound Infection	2(8%)
Mortality	1(4%)

DISCUSSION

CDH is a challenging emergency both for the paediatrician and paediatric surgeon, especially when severe respiratory distress develops within 6 hours of birth. Introduction of CMV, ECMO and pharmacological agents along with delayed repair of hernia have markedly influenced the outcome of high risk cases. In general, later the onset of symptoms, better the prognosis. Internationally postoperative survival figures close to 100% have been recorded for neonates who were brought for operation after the first 48 hours of life[8-9].

In our study symptomatology of all cases presenting in the neonatal period is similar to that reported in literature i.e respiratory distress and cyanosis since birth. Recurrent respiratory tract infection, vomiting and weight loss are common features in older cases beyond neonatal period. Major complication requiring secondary surgery was recurrence of hernia in one case which is (4%). This complication is also mentioned in literature at about 5% (Deprest JA et al) [7]. All of our cases presented after the first 12 hours of life and twenty four (96%) out of 25 cases survived after surgery. Mitanchez D[5] reported a postoperative survival of 92% in his study, which is close to our study.

ECMO[3-4] and Tracheal occlusion[10] for fetal congenital diaphragmatic hernia have also improved the outcome of CDH but these facilities are not available in developing countries such as Pakistan. Still best possible operative results were obtained with the help of limited existing facilities. It was also observed that patients who developed symptoms late had good prognosis and even conventional mechanical ventilation was not required in 36% cases.

CONCLUSION

Best possible results of surgery were obtained with the help of limited existing facilities. It was also observed that patients who developed symptom late had good prognosis even without CMV.

REFERENCES

1. Klaassens M, de Klein A, Tibboel D. The etiology of congenital diaphragmatic hernia: still largely unknown? Eur J Med Genet 2009;52(5):281-6.
2. Keller RL, Tacy TA, Hendricks-Munoz K, et al. Congenital diaphragmatic hernia: endothelin-1, pulmonary hypertension, and disease severity. Am J Respir Crit Care Med 15 2010;182(4):555-61.
3. Fliman PJ, deRegnier RA, Kinsella JP, Reynolds M, Rankin LL, Steinhorn RH. Neonatal extracorporeal life support: impact of new therapies on survival. J Pediatr 2006;148(5):595-9.
4. Bryner BS, West BT, Hirschl RB, et al. Congenital diaphragmatic hernia requiring extracorporeal membrane oxygenation: does timing of repair matter? J Pediatr Surg 2009;44(6):1165-71; discussion 1171-2.
5. Mitanchez D. [Neonatal prognosis of congenital diaphragmatic hernia]. Arch Pediatr 2009;16(6): 888-90
6. Hussain M, Pasha HK, Farooq U, Ashraf M, Sheikh MA. Congenital diaphragmatic hernia: Nishtar hospital experience. J Surg 1998; 3(1):8-9.
7. Deprest JA, Gratacos E, Nicolaides K, et al. Changing perspectives on the perinatal management of isolated congenital diaphragmatic hernia in Europe. Clin Perinatol 2009;36(2):329-47.
8. Peetsold M, Huisman J, Hofman VE, Heij HA, Raat H, Gemke RJ. Psychological outcome and quality of life in children born with congenital diaphragmatic hernia. Arch Dis Child 2009.
9. Walsh-Sukys MC, Tyson JE, Wright LL, et al. Persistent pulmonary hypertension of the newborn in the era before nitric oxide: practice variation and outcomes. Pediatrics 2000;105(1 Pt 1):14-20.
10. Jelin E, Lee H. Tracheal occlusion for fetal congenital diaphragmatic hernia: the US experience. Clin Perinatol 2009;36(2):349-61.