Case Report

Access this article online
Website: www.afrjpaedsurg.org
DOI: 10.4103/0189-6725.125452
Quick Response Code:

Octreotide treatment in a neonate with non-chylous pleural effusion

Salih Kalay, Osman Oztekin, Gonul Tezel, Burak Emre Demir, Mustafa Akcakuş, Nihal Oygur

ABSTRACT

Fetal pleural effusion is a rare condition. While it may regress spontaneously, it may also continue up to the post-natal period. This condition may be treated by thoracentesis, thoracoabdominal shunt application and pleurodesis in the intrauterine period while thoracentesis or tube thoracostomy may be used in the post-natal period. In cases where the fluid is defined to represent chylothorax, octreotide, a somatostatin analogue, may be administered for treatment. In this case report, we discussed the outcomes of treatment with octreotide administered in a neonatal case under follow-up due to fetal pleural effusion and with non-chylous ascites detected in the post-natal period.

Key words: Neonate, non-chylous pleural effusion, octreotide

INTRODUCTION

Fetal pleural effusion is defined as non-specific fluid accumulation in the pleural cavity. It is a rare condition with an incidence ranging between 1/10000 and 15000.[1] It may manifest primarily or secondarily. The primary pleural effusion is defined as hydrothorax in the antenatal period while it is mostly defined as chylothorax in the post-natal period.[2] The clinical course may involve a spontaneous regression or pre-term delivery or death resulting from the occurrence of hydrops and polyhydramniosis with an increase in the accumulation of fluid. The prognosis is dependent on the pulmonary maturity together with the co-existence of abnormalities and hydrops.[3] The condition may be treated by thoracentesis, thoracoabdominal shunt application and pleurodesis in the intrauterine period while thoracentesis or tube thoracostomy may be used in the post-natal period.[2] In cases where the fluid accumulation in the pleural cavity is defined to represent chylothorax in the post-natal period, octreotide, a somatostatin analogue may also be administered.[4]

In our patient, we detected non-chylous pleural effusion. Ascites progressively increased and did not respond to drainage by thoracic tube. Our patient was administered treatment with octreotide, an agent demonstrated to be beneficial in the treatment of chylous pleural effusion in previous trials. Pleural effusion exhibited a complete regression after the treatment.

CASE REPORT

On the prenatal routine ultrasonographic monitoring of the 28-year-old, blood type ARh (+) mother who was under regular physician supervision, effusion was detected in the left hemithorax of the fetus in the 32nd gestational week [Figure 1]. Based on the assessments performed, immune causes, the presence of infection, and chromosomal abnormalities (46 XY) were excluded other than the potential structural causes that could lead to pleural effusion. 74 and 53 cc of fluid was removed respectively by intrauterine thoracentesis performed twice at a 1 week interval. The fluid was detected to be of non-chylous nature (protein 0.9 g/L, albumin 0.78 g/dl, lactate dehydrogenase (LDH) 90 U/L, total cholesterol 2 mg/dl, triglyceride 1 mg/dl, leukocytes 10/mm^3). A cesarean delivery was performed in the patient at 38th gestational week and 3340 g (50 p). The lung graphy showed radiopaque image in the left hemithorax [Figure 2a]. A 35 mm × 40 mm fluid accumulation was detected in the left hemithorax on thorax ultrasonography (USG). Fluid was removed by thoracentesis since the respiratory distress progressively

Department of Pediatrics, Division of Neonatology, School of Medicine, Akdeniz University, Konyaalti, Antalya, Turkey

Address for correspondence:
Dr. Salih Kalay,
Department of Pediatrics, Division of Neonatology,
School of Medicine, Akdeniz University, Turkey.
E-mail: salihkalay@hotmail.com



Figure 1: Prenatal ultrasonography with pleural effusion

increased within the 1st h. The biochemical analysis of the clear, yellow fluid revealed the following: protein 1 g/L, albumin 0.8 g/dl, LDH 179 IU/L, total cholesterol 9 mg/dl, triglyceride 13 mg/dl, leukocytes 700/mm^3; microscopic examination revealed a rate of 60% granulocytes and 40% lymphocytes. The fluid was considered to represent non-chylous ascites. The patient with a negative TORCH-S was detected to have normal whole blood values, and normal hepatic and renal functions tests, levels of electrolyte and C-reactive protein (CRP). The thoracic USG repeated on the 2nd day of hospitalization showed an increase in the fluid accumulation observed to be 68 mm × 34 mm in the left hemithorax. Free fluid drainage was achieved by the placement of a thoracic tube. Subsequently, patient's daily fluid drainage was measured to be 70, 90, 130, 85 and 100 cc, respectively. The follow-up fluid biochemical analysis of the patient who was shifted to complete oral nutrition revealed the following: clear, yellow appearance; albumin 0.6 g/dl, LDH 434 IU/L, total cholesterol 16 mg/dl, triglyceride 12 mg/dl, leukocytes 1430/mm^3; microscopic examination revealed a rate of 55% granulocytes and 45% lymphocytes. No marked change in the characteristic of the fluid was detected. On the 20th day follow-up by tube drainage, a daily fluid drainage between 70 cc and 130 cc was observed to be achieved. Upon failure to achieve any benefit from the tube drainage, treatment with octreotide, an agent demonstrated to be beneficial in the treatment of chylous ascites in the literature was considered for treatment. The family was informed about the treatment and the treatment was initiated at a dose of 25 mcg/kg/day after obtaining consent from the family. As from the 24th h of treatment, the amount of the drained fluid started to show a reduction, and completely disappeared on the 5th day of treatment. No side effects occurred during the treatment. After removing the thoracic tube,

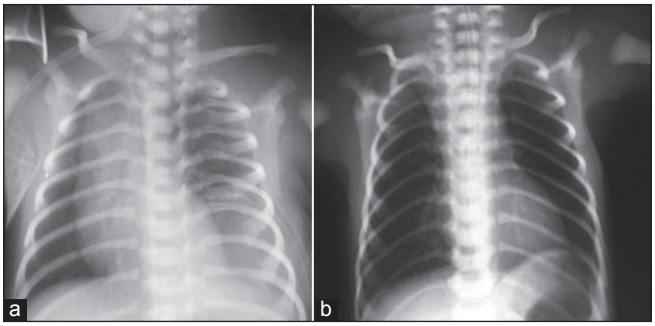


Figure 2: Pulmonary graphy with pleural effusion (a) complete resolution (b)

the follow-up pulmonary X-ray [Figure 2b] and the thoracic USG performed revealed no recurrence of the fluid accumulation. The patient was discharged in a healthy status at the 28th day.

DISCUSSION

The follow-up and the treatment of patients with fetal pleural effusion still remain controversial. Based on the general opinion, administration of prenatal treatment is recommended in selected cases with a high level of fluid accumulation due to a high risk of perinatal mortality and morbidity. Yet, the recommended therapeutical approach includes thoracentesis for patients diagnosed after the 34th gestational week and placement of thoracoabdominal shunt before the 34th gestational week if hydrops or polyhydramniosis has been detected. As for patients without additional risk factors, who have been diagnosed before the 34th gestational week, weekly follow-up by USG is recommended.[5] in all modalities of treatment, the main prognostic determinant is the formation of hydrops, which is closely correlated with mortality. In their recent trial, Rustico *et al.*[5] reported a survival rate of 62% and 50% respectively for fetal pleural effusion patients with concomitant hydrops, who were administered shunt or thoracentesis and a survival rate between 82% and 77% for patients without concomitant hydrops. Although, the superiority of thoracoabdominal shunt application over thoracentesis is reported particularly in pleural effusion patients with concomitant hydrops, this application is recommended for selected patients and in cases where there's a requirement for repeated thoracentesis. However, the outcomes of the different treatment modalities in patients without hydrops are not clear.[2] Our patient diagnosed at the 32nd gestational week was put under follow-up with two applications of thoracentesis performed due to the high amount fluid detected despite the absence of any defined risk factors; fluid accumulation did not recur on follow-up and no repeated thoracentesis was

required. Reasons including the fact that our patient was born at term, absence of hydrops formation, absence of concomitant polyhydramniosis and the presence of lateral fluid accumulation have increased the expectancy for survival.

Post-natal pleural effusions may exhibit regression with an asymptomatic course or may manifest clinical symptoms at any period of the neonate, being primarily respiratory distress. If any etiology is detected in the treatment of the post-natal pleural effusion, various interventions including conservative monitoring, thoracentesis, thoracic tube drainage may be performed in addition to therapies targeting the etiology. The most common cause of the pleural effusions detected in the neonatal period is chylothorax. While approximately half of the cases with chylothorax manifest symptoms at delivery, the remaining become symptomatic upon initiation of nutrition (rocha). The diagnosis is established by the chemical analysis of the fluid. Chylous ascites is recognized by the yellowish milky appearance according to the nutritional status, a pH between 7, 4 and 8, a total fat of 0, 4-5 g/dl, triglycerides > 110 mg/dl, a total cholesterol of 65-220 mg/dl, a total protein of 2, 2-5, 9 g/dl and an albumin level of 1, 2-4, 1 g/dl, a specific fluid density of 1012-1025 and the predominance of lymphocytes 80-100%.[6] Recently, the use of a somatostatin analogue, octreotide in chylothorax cases not responding to conservative and surgical procedures has been introduced and relevant case reports have been published. Octreotide leads to a moderate vasoconstriction in the splanchnic veins. It also reduces the intestinal absorption and hepatic venous flow together with the gastric, pancreatic and intestinal secretions. As a result of these effects, this agent is reported to be effective in cases with congenital or acquired chylothorax by decreasing the intestinal lymphatic flow. in addition, there also data showing that it results in an earlier shift to enteral nutrition and a reduced duration of hospitalization.[6-8] It was demonstrated that the patients receiving intravenous octreotide (0, 3-10 mcg/kg/h) for a period of 2-61 days following the formation of primary or secondary chylothorax achieved a clinical benefit potentially on the 1st day of treatment, but the onset of benefit is observed usually within 5-6 days. No serious adverse effects other than transient changes in blood sugar levels, abdominal distention and vomiting have been reported during the treatment. However, two patients receiving somatostatin were reported to experience an increase in hepatic enzymes and flushing that resulted in discontinuation of the treatment. There is no certain information on the duration and the dosage of the octreotide treatment.[8,9]

In the literature, no data was detected on the use of octreotide in patients with pleural effusion other than the cases of chylothorax. The patient with undetectable etiology, who was not consistent with chylothorax did not respond to the application of tube drainage for 20 days and no reduction in the amount of drained fluid was detected. Considering the successful outcomes achieved with octreotide in patients with chylothorax, this agent was administered after obtaining consent from the family. The amount of the drained fluid showed a marked reduction at the 48th h of treatment. On the 5th day of treatment, the patient was observed to show a complete recovery and the treatment was discontinued. No side-effects occurred. The patient is currently under follow-up in a healthy status at the 3rd month.

We don't have enough data on the mode of action of the octreotide treatment administered in the patient with non-chylous pleural effusion. This agent may have been effective in the treatment of non-chylous ascites through its vasoconstrictor or secretion-reducing efficacy or through undefined mechanisms. Treatment with octreotide may provide benefits in selected patients with non-chylous pleural effusion, who don't respond to the application of tube drainage.

REFERENCES

1. Longaker MT, Laberge JM, Dansereau J, Langer JC, Crombleholme TM, Callen PW, *et al*. Primary fetal hydrothorax: Natural history and management. J Pediatr Surg 1989;24:573-6.
2. Yinon Y, Kelly E, Ryan G. Fetal pleural effusions. Best Pract Res Clin Obstet Gynaecol 2008;22:77-96.
3. Rocha G, Fernandes P, Rocha P, Quintas C, Martins T, Proença E. Pleural effusions in the neonate. Acta Paediatr 2006;95:791-8.
4. Sivasli E, Dogru D, Aslan AT, Yurdakok M, Tekinalp G. Spontaneous neonatal chylothorax treated with octreotide in Turkey: A case report. J Perinatol 2004;24:261-2.
5. Rustico MA, Lanna M, Coviello D, Smoleniec J, Nicolini U. Fetal pleural effusion. Prenat Diagn 2007;27:793-9.
6. Rocha G. Pleural effusions in the neonate. Curr Opin Pulm Med 2007;13:305-11.
7. Aubard Y, Derouineau I, Aubard V, Chalifour V, Preux PM. Primary fetal hydrothorax: A literature review and proposed antenatal clinical strategy. Fetal Diagn Ther 1998;13:325-33.
8. Siu SL, Lam DS. Spontaneous neonatal chylothorax treated with octreotide. J Paediatr Child Health 2006;42:65-7.
9. Roehr CC, Jung A, Proquitté H, Blankenstein O, Hammer H, Lakhoo K, *et al*. Somatostatin or octreotide as treatment options for chylothorax in young children: A systematic review. Intensive Care Med 2006;32:650-7.

Cite this article as: Kalay S, Oztekin O, Tezel G, Demir BE, Akcaku? M, Oygur N. Octreotide treatment in a neonate with non-chylous pleural effusion. Afr J Paediatr Surg 2013;10:374-6.

Source of Support: Nil. **Conflict of Interest:** Nil.