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Paracetamol in Premature Patent Ductus Arteriosus (PDA)

A. Tbatou[1*], C. Nasmi[1], A. Ayad[1], R. Abilkassem[1], A. Agadr[1]

[1]Depart Ped Mohammed V University, Rabat, Morocco

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***Corresponding author:** A. Tbatou
Depart Ped Mohammed V University, Rabat, Morocco

Abstract | **Original Research Article**

Paracetamol appears to be a promising new alternative to indomethacin and ibuprofen for persistent ductus arteriosus closure, with potentially fewer adverse effects and, above all, lower cost. Further studies of this procedure with longer-term follow-up are needed before paracetamol can be recommended as a standard treatment for PCA in premature infants.

Keywords: Persistence of the ductus arteriosus, premature, diagnosis, treatment, paracetamol.

INTRODUCTION

Although patent ductus arteriosus is essential for fetal circulation, postnatal ductal closure is essential for postnatal circulatory adaptation. In premature infants, circulating levels of prostaglandins are higher than at term, and respiratory difficulties can lead to a state of hypoxia that contributes to failure of ductal closure. Recently, an incidental finding in a premature infant has led to the consideration of paracetamol, one of the most commonly available drugs, as an alternative therapeutic approach to ductal closure. Should paracetamol prove effective, it could become the treatment of choice for the management of PDA, mainly due to its more favorable tolerability profile.

METHODS

A retrospective study was conducted in the neonatal intensive care unit of the rabat military hospital over a 2-year period from November 2020 to December 2022.

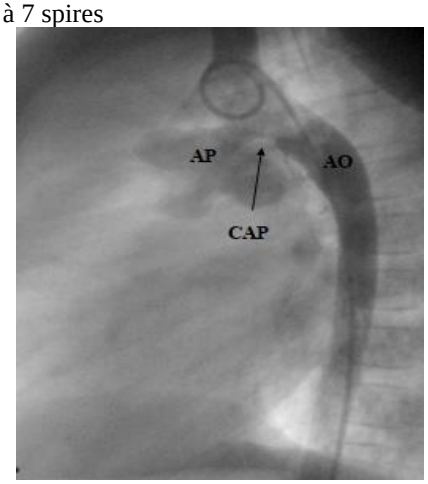
Premature male or female newborns without race limitation with a gestational age of 28 to 35 SA; aged 24 to 72 h and with echocardiographic evidence of a hemodynamically significant patent ductus arteriosus during the first 24 to 72 hours of life were included.

The diagnosis of hemodynamically significant PDA requiring treatment will be made by echocardiographic evidence of a left-right ductal shunt, with a left atrium/aortic root ratio > 1.3 or ductal size > 1.5 mm.

RESULTS

50 newborns were included, receiving intravenous paracetamol at a dose of 15 mg/kg/6h for 4 to 6 days. Successful closure of the PDA was assessed by daily echocardiography on 4 consecutive days. The success rate of complete closure was 60% the reopening rate after 1 treatment cycle was 10% there was 1 case of massive PAO requiring surgical ligation on bypass grafts, and the incidence of adverse events such as renal failure, liver failure and gastrointestinal complications was nil. No deaths were directly attributed to PDA.

Coils 3 à 7 spires



DISCUSSION

The persistence of the ductus arteriosus, very common in premature infants (70% of newborns with a gestational age < 28 weeks), results in a left-to-right shunt responsible for pulmonary hyperflow and low systemic flow. These hemodynamic disturbances are associated with an increased incidence of neurological, respiratory and digestive complications of prematurity, as well as with excess mortality. Despite advances in our understanding of ductal closure mechanisms and treatment options, the management of persistent ductus arteriosus in premature infants is still the subject of much debate treatment is based on prevention of hypothermia, which increases LV preload, adequate ventilatory support. Maintaining a 35-45% hematocrit increases pulmonary resistance and reduces G-D shunt through the channel. Moderate fluid intake (120-130 cc/kg/d) to limit pulmonary edema.

Diuretics: thiazide diuretics are superior to furosemide, which stimulates PGE2 synthesis in premature infants and is associated with a high risk of renal failure and hyponatrem.

Cyclo-oxygenase inhibitors:reduce prostaglandin-induced vasodilation by inhibiting the cyclooxygenase site of the prostaglandin H2 synthetase complex.

Paracétamol: Much more recent use. Ductal closure is achieved by inhibition of the peroxidase site of prostaglandin H2 synthase.

The risk of hepatotoxicity appears low.

Surgical ligation:

Interventional catheterization

RECOMMANDATIONS

A. General measures provided to all preterm infants include a neutral thermal environment, moderate fluid restriction between 110 and 130 mL/kg per day, optimizing respiratory support that provides adequate oxygenation (Grade 1A).

B. In infants with a PDA who remain dependent on mechanical ventilation after one week, we suggest a course of COX inhibitors (Grade 2B).

C. Second course of COX inhibitor is administered if follow-up echocardiography demonstrates a persistent PDA and the infant remains ventilator dependent

D. Surgical ligation is reserved for infants with large PDAs who remain on maximal ventilator settings and have failed to respond to COX inhibitor therapy (Grade 1B).

E. Prophylactic therapy would unnecessarily expose infants who would not develop significant PDAs to drugs with potentially serious adverse effects (Grade 1B).

CONCLUSION

The literature has shown that very early medical treatment of PCA brings short-term benefits. Paracetamol appears to be a promising new alternative to indomethacin and ibuprofen for the closure of persistent patent ductus arteriosus, with potentially fewer adverse effects and, above all, lower cost.

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