# 13. PHARMACOLOGICAL MANAGEMENT OF PATENT DUCTUS ARTERIOSUS

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**Introduction.** The ductus arteriosus (DA) is located between the aortic arch and the pulmonary artery in the fetal circulation, and its closure is one of the most important changes required for the transition to extrauterine life. Persistent hemodynamically significant patent ductus arteriosus (hsPDA) is a common cause of morbidity and mortality affecting over 40% of preterm infants. Prolonged hsPDA disrupts systemic hemodynamics, causing pulmonary hemorrhage, bronchopulmonary dysplasia, neurological disorders, acute renal failure, septicemia.

**Aim of study.** The aim of the study was to review and analyze the pharmacological management of patent ductus arteriosus

**Methods and materials.** This article is based on data collected from several articles available on PubMed, NCBI and Google Scholar, Medscape that have been published since 2017.

**Results.** Currently, the most common drugs aimed at pharmacological closure of patent ductus arteriosus are cyclooxygenase (COX) inhibitors, especially indomethacin and ibuprofen. Analysis of formal studies in databases demonstrated the efficacy of indomethacin in the persistence of patent ductus arteriosus. During treatment there was a response in 13 out of 15 in the indomethacin group and in 3 out of 15 in the control group. Paracetamol was used in children unresponsive to indomethacin or ibuprofen, or in those in whom COX inhibitors were contraindicated, and the DA closure rate was observed to be greater than 90%. In a study conducted by the Turkish Society of Neonatology, it was compared with oral paracetamol and ibuprofen, and it was found that the rates of ductal closure were similar and no difference was found in what adverse effects were found. However, paracetamol is not the standard treatment option, studies need to be conducted to demonstrate its effectiveness and safety. Ibuprofen (intravenous or oral), compared with placebo, was significantly more effective in reducing the presence of patent ductus arteriosus (PDA) at 72 hours of treatment. The spontaneous PDA closure rate was 58% in the control group.

**Conclusion.** NSAID-induced PDA closure is considered to be 75-80% effective. NSAID therapy (indomethacin, ibuprofen), started in the first days after birth, leads to a decrease and even closure of the duct. After oral administration of the drug, closure of the PDA occurs in 18-20%, and after intravenous administration in 88-90% of cases. Indomethacin is used intravenously at a rate of 0.2 mg/kg/day for 2-3 days. Ibuprofen lysine IV and indomethacin are chemically different and inhibit COX-1 and COX-2 isoforms to different degrees. They were shown to be equally effective in closing PDA in preterm infants and significantly more effective than placebo. The need for rescue medical treatment was significantly reduced, as was the need for surgical closure of the PDA.