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### **Ibuprofen vs. Indomethacin in Treatment of PDA Closure: An Integrative Research Review**

Isabel Ramos

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# Ibuprofen vs. Indomethacin in Treatment of PDA Closure:

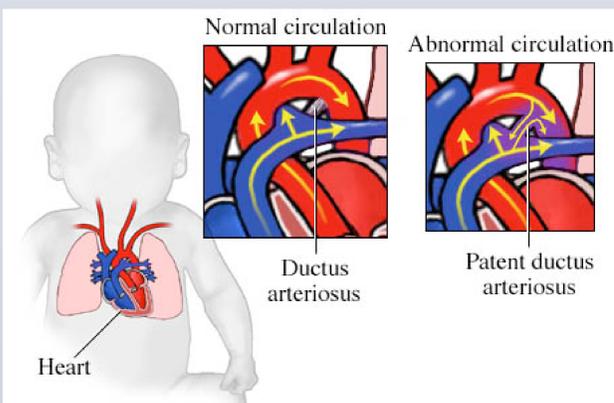
## An Integrative Research Review

Isabel Ramos, MSN, RNC-NIC



### BACKGROUND AND SIGNIFICANCE

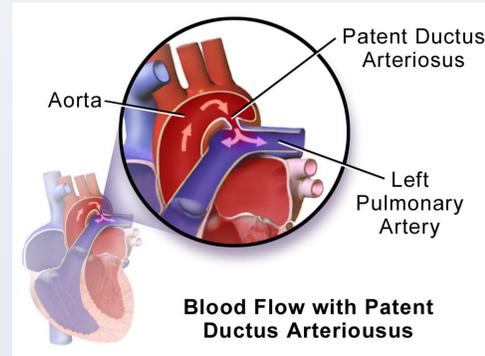
- Patent ductus arteriosus is a congenital disorder in neonates in which the vessel fails to close after birth and remains patent or open (Jinmiao, Jing, Qin, & Zhiping, 2017).
- Delayed closure of ductus arteriosus (PDA) in preterm infants under 28 weeks is associated with high incidence of pulmonary hemorrhage, intraventricular hemorrhage (IVH), necrotizing enterocolitis (NEC), chronic lung disease and high mortality (Bhat & Das, 2015).
- Therefore, closure of the PDA is essential to prevent these complications and to improve both cardiorespiratory status and survival rate (El-Mashad, El-Mahdy, El Amrousy, Elgendy, & El-Mashad, 2017).
- Initially indomethacin was the drug of choice for treating PDA; however it can affect renal, gastrointestinal and cerebral organs. These complications can lead to transient or permanent renal dysfunctions, necrotizing enterocolitis, gastrointestinal hemorrhage and reduced cerebral intracellular oxygenation (Yang et al., 2013).
- Ibuprofen was introduced and approved by the FDA as an alternative agent in April 2006 for closure of PDA in premature infants (Yang, Song & Choi 2013).



Retrieved from: <http://www.doctoripster.com/wp-content/uploads/2011/07/patent-ductus-art>

### RESEARCH QUESTION

“Does Ibuprofen compared to Indomethacin have the same efficacy with fewer adverse effects in treating patent ductus arteriosus in a preterm infant?”

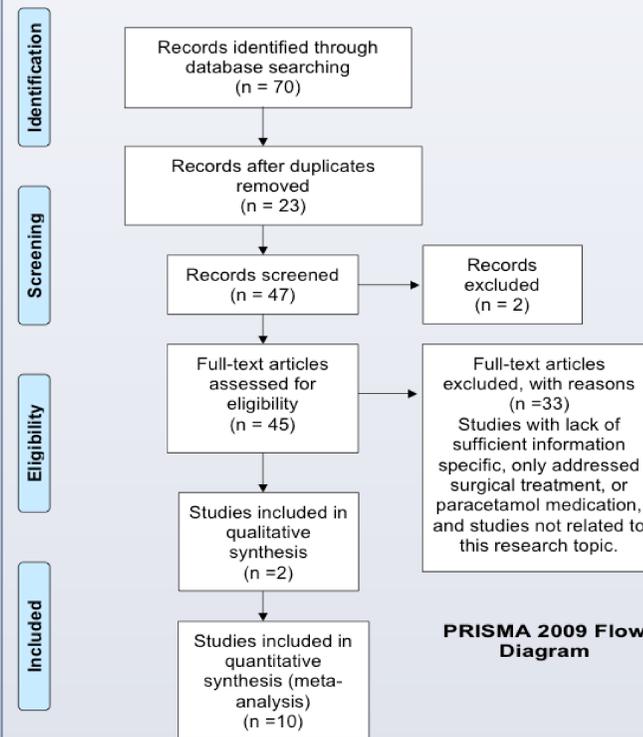


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### METHODOLOGY

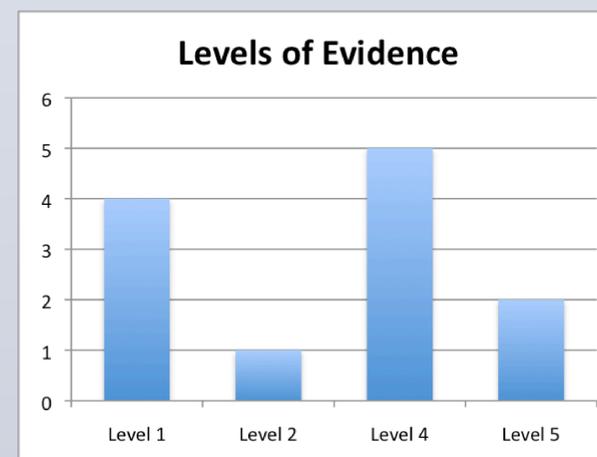
- An integrated review of the literature was conducted using the methodology described by Whittemore and Knafl (2005) and Brown (2018).
- Cochrane, CINAHL, Medline Complete and Pub Med were searched using the following key terms “ibuprofen”, and “indomethacin”, and “patent ductus arteriosus”.
- Search criteria was limited to “full text articles” between the years 2013-2018 for all databases.
- Inclusion criteria included studies involving the evaluation of the efficacy in closure of PDA using ibuprofen or indomethacin, adverse effects related to this treatment utilizing these medications, routes of administrations and dosages.
- The original search identified 70 articles. After screening the articles, 23 duplicate articles were removed, 1 article was not available in English, 1 article was not available in full text and 33 articles were excluded due to pertaining to surgical treatment or studying paracetamol medication or not related to this research topic.
- Findings from the studies were synthesized for comparative analysis of results.

### LITERATURE SEARCH FLOW DIAGRAM



### RESULTS

- Seventy articles were initially identified; twelve included in final sample.
- Level of evidence rated using evidence pyramid published by Long & Gannaway and Appraisal Guides by Brown (2015; 2018).



### LITERATURE SYNTHESIS

- Ibuprofen was found to be as effective as indomethacin for successful treatment of PDA closure. This was noted by Ohlsson et al., El-Mashad et al., ElHassan et al., Chan et al., Pacifici et al., Gulack et al., Loomba et al., Yang et al., (2015, 2017, 2014, 2014, 2014, 2015, 2015, 2013).
- Ibuprofen had fewer side effects than indomethacin but showed to have significant increase in serum bilirubin levels (ElHassan et al., 2014).
- Ohlsson et al., Malikiwi et al., ElHassan et al., Pacifici et al., Loomba et al., Yang et al., all found ibuprofen groups had lower creatinine levels and reduced risk of oliguria compared to those treated with indomethacin (2015, 2015, 2014, 2014, 2015, 2013).
- Ibuprofen groups did however have more pulmonary hypertension compared to those in the indomethacin group. This was noted by Malikiwi et al., ElHassan et al., (2015, 2014).
- Jinmiao et al., Mitra et al., found high dose oral ibuprofen was more effective in closure of PDA compared to IV ibuprofen and IV indomethacin, but more studies are needed to determine long term adverse effects (2017, 2018).

### CLINICAL IMPLICATIONS

- Ibuprofen is shown to be as effective as indomethacin in treatment of PDA closure.
- Ibuprofen does show to have fewer adverse effects although both medications do come with significant adverse effects.

### CONCLUSION

- Results of this literature have shown ibuprofen is as effective as indomethacin in PDA closure.
- However the adverse effects have not been proven to be majorly different. Further level 1 evidence research is needed to determine the safest medication for treatment in PDA closure.

### REFERENCES

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