

Propranolol Treatment in Periocular Pediatric Patients with Hemangiomas

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Hemangiomas

Hemangiomas are benign vascular tumors made up of rapidly growing vascular cells, which typically appear during the first days or weeks of life. Hemangiomas are a buildup of blood vessels and are the most common type of vascular anomalies (birthmarks). The majority of hemangiomas will disappear or fade over time without any intervention. Hemangiomas that are potentially disfiguring, may endanger the patient's normal functioning, or be life-threatening (vision, feeding, breathing) require treatment. Hemangiomas may appear anywhere, internally or externally. However, 80% of hemangiomas are located on the face and neck. Approximately 30% of hemangiomas are noted at birth.

Hemangiomas may initially manifest as a faint red mark. Some hemangiomas appear as reddish or bluish spots or patches. Superficial hemangiomas appear red and flat, whereas deep hemangiomas are beneath the skin and appear bluish. Compound hemangiomas are both deep and superficial.

There are potential visual complications associated with hemangiomas located on or around the ocular area. Approximately 43%–60% of patients with periocular hemangiomas will develop amblyopia (lazy eye). This complication occurs more frequently when a lesion develops on the upper eyelid. Other complications that may interfere with patient's vision include: strabismus (crossed eyes), myopia (nearsightedness), tear-duct obstruction, proptosis (forward displacement/bulging of the eye), and ptosis (drooping eyelid).

Risk factors of hemangioma include: females, who are 5 times more likely as males to develop a hemangioma, premature infants, Caucasians, infants born to mothers with placental abnormalities, and low-birth-weight infants that have a 26% chance of developing a hemangioma.

Treatment options for hemangiomas include corticosteroid treatment, given by injection directly into the tumor. Excision of the hemangioma is sometimes indicated for a well-localized lesion. Historically, oral corticosteroid treatment, interferon, and vincristine have also been used to treat hemangiomas. Recently, the use of propranolol has proven successful in shrinking hemangiomas.

Propranolol

Physicians at the Bordeaux Children's Hospital in Bordeaux, France, serendipitously discovered the use of propranolol for the treatment of hemangiomas while treating two infants with heart conditions with propranolol. Both infants had hemangiomas that were coincidentally reduced in color and size after the initiation of propranolol for their cardiac issues.

Propranolol is a nonselective beta blocker that reduces cardiac oxygen demand by blocking catecholamine-induced increases in heart rate, blood pressure, and force of myocardial contraction. It depresses rennin secretion and prevents vasodilation of cerebral arteries. It is commonly used to treat hypertension, angina pectoris in adults, and supraventricular, ventricular, and atrial arrhythmias. It is also used to

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The authors have nothing to disclose.

Learning Objectives

- Describe safe administration of propranolol to children for treatment of hemangiomas.
- Discuss nursing care of patients with hemangiomas treated with propranolol.

prevent migraine headaches. The most common side effects are hypotension, bradycardia, and intensification of AV block, bronchospasm, agranulocytosis, fatigue, and lethargy. In the treatment of hemangiomas, it is proposed that propranolol simply decreases the blood supply to the tumor, which causes a reduction in size. There were no reported adverse reactions to the propranolol for the infants in the study.

Although the infants did not have any adverse reactions when given propranolol, nurses are still required to monitor the patient closely for potential side effects. Most importantly, an apical pulse and blood pressure should be taken just prior to administering the medication. If either the apical pulse and/or blood pressure are low, the physician caring for the patient should be notified prior to the administration of the medication. Other nursing considerations are the assessment of lung sounds and notification of the physician if any wheezing is heard. In addition, the nurse must monitor the patient's intake (feedings) as propranolol may block signs of hypoglycemia. Special consideration should be given to those patients with a history of diabetes.

The dose is based on weight; 2mg/kg/day. Sometimes it is lowered to 1mg/kg/day. The medication is given orally. After initiation of the medication, the patient is usually monitored in the hospital or clinic for 6 to 24 hours. The patient then will go home on a regular oral dose of propranolol for a period of time. It is imperative that parents taper propranolol as instructed. It is important for the nurse to caution the family not to stop the medication until directed by the doctor. The family must be instructed to check with the physician prior to giving other medications.

Parents of children with hemangiomas sometimes have concerns related to potential disfigurement related to the hemangiomas. Connecting these parents with the other parents of children with hemangiomas can be very helpful. Providing the parents with a list of web sites and/or support groups may give the parents some support in dealing with any fears they may have.

Conclusion

The use of propranolol in infants and children with hemangiomas is a new treatment that is still being researched and studied. The patient, family, and physician should collaboratively determine the best treatment for the patient. It is important for all nurses caring for patients with hemangiomas to consider all the available treatments for hemangiomas and be able to answer patient and parents' questions.

References

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