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ORIGINAL ARTICLE

The role of propranolol in the treatment of infantile hemangioma

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KEYWORDS
Infantile hemangioma;
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Abstract
Introduction: Infantile hemangioma (IH) is one of the most common childhood tumors. There are various medical or surgical therapeutic options, all with suboptimal results. Recently, the successful use of propranolol for involution of IH was described. We report the results of a single-center experience with this therapeutic option.
Objective: To prospectively assess the efficacy and safety of propranolol in children with infantile hemangioma.
Methods: We performed a prospective analysis of clinical data of all patients with IH referred to a pediatric cardiology center for baseline cardiovascular assessment prior to propranolol therapy. Propranolol was given at a starting dose of 1 mg/kg/day and titrated to a target dose of 2–3 mg/kg/day according to clinical response. Efficacy was assessed through a photograph-based severity scoring scale. Safety was assessed by collecting data regarding significant side effects.
Results: Starting in 2010, 30 patients (15 female) were referred for propranolol treatment of IH, at a median age of six months (1–63 months). The mean target propranolol dose was 2.8 mg/kg/day, with a mean duration of therapy of 12 months. All patients experienced significant reduction of IH size and volume. There were no side effects.
Conclusions: In our experience propranolol appears to be a useful and safe treatment option for severe or complicated IH, achieving a rapid and significant reduction in their size. No adverse effects were observed, although until larger clinical trials are completed, potential adverse events should be borne in mind and consultation with local specialists is recommended prior to initiating treatment.
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PALAVRAS-CHAVE
Hemangioma infantil;
Propranolol

O papel do propranolol no tratamento dos hemangiomas em idade pediátrica

Resumo
Introdução: Os hemangiomas são a lesão tumoral cutânea mais frequente em idade pediátrica. Até ao momento todas as opções terapêuticas (tanto médicas como cirúrgicas) têm resultados sub-ótimos. Recentemente, foi descrita a utilização de propranolol para tratamento dos hemangiomas. Relatamos os resultados da nossa experiência com esta opção terapêutica.
Objetivo: Avaliação prospetiva da eficácia e segurança de propranolol em crianças com hemangioma infantil.
Métodos: Avaliação prospetiva de todos os doentes com hemangioma referenciados para avaliação cardiovascular prévia ao início de terapêutica com propranolol. O propranolol foi administrado numa dose inicial de 1 mg/kg/dia e titulada para uma dose alvo de 2–3 mg/kg/dia, de acordo com a resposta clínica. A eficácia foi avaliada através de uma escala fotográfica. A segurança foi avaliada através da recolha de dados sobre os efeitos secundários significativos.
Resultados: Desde 2010, 30 crianças (15 do sexo feminino) com hemangiomas foram referenciados para avaliação cardiovascular prévia ao início de terapêutica beta-bloqueante, com uma idade média de 6 meses (1-63 meses). A dose alvo média atingida foi de 2,8 mg / kg / dia, com uma duração média de tratamento de 12 meses. Em todos os doentes se verificou uma redução significativa das dimensões e volume dos hemangiomas. Não foram observados efeitos colaterais.
Conclusões: Na nossa experiência, o propranolol é uma opção eficaz e segura para o tratamento de hemangiomas extensos ou complicados, obtendo-se uma redução rápida e significativa das suas dimensões. Não foram observados efeitos adversos contudo, recomenda-se a avaliação cardiovascular sistemática, prévia ao início de terapêutica com propranolol.
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Introduction

Infantile hemangiomas are the most common benign vascular tumors in infancy, affecting 5–10% of the population. Females are affected more often than males, with a ratio of 3:1.[1] Typically they present shortly after birth, undergo a period of rapid proliferation, and then slowly involute over many years.[2,3] Although most are small cutaneous vascular malformations of the face,[4] they can also be large, disfiguring lesions with serious complications. Infants with large hemangiomas, especially those with a segmental distribution or hemangiomatosis, are at particular risk for extracutaneous complications. They may also be associated with other congenital malformations, such as PHACE,[5] PELVIS[4] or SACRAL syndrome.[6,7]

In most cases only parental education and reassurance are required. Although 85–90% of all infantile hemangiomas eventually undergo spontaneous involution, a minority can still cause disfigurement and serious complications, depending on their location (obstruction of airways and vision), size, and speed of regression, which can be associated with painful ulcerations and hemorrhage or even high-output heart failure.[4,8,9] Hemangiomas with the potential to threaten a child's life or vital functions and those that ulcerate or cause substantial disfigurement warrant treatment,[10] which may be medical or surgical, or a combination of both.[11]

At present there is no gold standard medical treatment. Unfortunately, current therapeutic approaches have limited success and significant adverse effects that limit their use.[12–16] Since Léauté-Labrèze's accidental observation[17] of the anti-proliferative effect of propranolol on infantile hemangiomas, propranolol has become increasingly popular[18,19] as a successful therapeutic option, with fewer side effects than other treatments.

We present a single-center study describing the efficacy and safety of propranolol in children with infantile hemangiomas.

Methods

Inclusion and exclusion criteria

All patients were referred by their pediatric dermatologist or pediatric surgeon to a pediatric cardiology department for baseline cardiovascular assessment prior to propranolol therapy, and cardiovascular assessment during therapy.

Patients with infantile hemangiomas were considered for propranolol treatment if they met the following criteria: eyelid involvement with risk of ocular occlusion or compression; airway obstruction; or large hemangioma with significant disfigurement or ulceration. Patients previously treated with other therapeutic modalities were also considered candidates for inclusion if the previous treatment had failed. Exclusion criteria included cardiac anomalies, central nervous system vascular anomalies as in PHACE syndrome, hypoglycemia, asthma or bronchospasm. While the

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