Use of the Hemangioma Severity Scale to facilitate treatment decisions for infantile hemangiomas

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Background: The Hemangioma Severity Scale (HSS) assesses the severity of an infantile hemangioma (IH).

Objective: First, to compare HSS scores between patients with IH for whom propranolol treatment was indicated at their first visit and those who were not treated. Second, to assess suitable cutoff values for the need for propranolol treatment.

Method: All patients with IH who attended our tertiary referral center since 2008 and were 0 to 6 months of age at their first visit were included. They were divided into propranolol and no-propranolol groups on the basis of choice of treatment at their first visit. HSS scores were assessed, and median scores were compared.

Results: A total of 657 children (342 in the propranolol group) were included. The median HSS score (25th-75th percentile) in the propranolol group was 10 (range, 8-14) compared with 7 (range, 4-9) in the no-propranolol group ($P < .001$). Cutoff values of 6 or lower (no indication for treatment) and 11 or higher (indication for treatment) resulted in 94% sensitivity and 89% specificity, respectively.

Limitations: HSS scoring was not completely blinded.

Conclusion: The HSS with cutoff values of 6 or lower and 11 or higher could be used as a triage tool for propranolol treatment. Patient age, IH type, and parental preference may also contribute to treatment decisions. (J Am Acad Dermatol 2017;77:868-73.)

Key words: clinical practice; cutoff values; infantile hemangioma; propranolol; severity; treatment indication.

Discovery of the benefit of propranolol in 2008[1] revolutionized the treatment of infantile hemangiomas (IHs).[2] IH is a benign self-limiting tumor, and most do not require treatment.[3] Propranolol is indicated for more severe IH.

Abbreviations used:

AUC: area under the curve
HSS: Hemangioma Severity Scale
IH: infantile hemangioma

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Currently, IH severity and the need for treatment are assessed subjectively by the attending physician in dialogue with the parents. To quantify severity, several scoring tools have been developed; of these, the Hemangioma Severity Scale (HSS) seems the most promising.[4-6]

Studies on correlation between scoring systems and treatment indication are limited.[5,7] The main objective of our study was to assess IH severity by using the HSS at the first consultation, when treatment was determined. Our secondary objective was to find suitable HSS cutoff values for propranolol treatment. A tertiary objective was to determine factors influencing the choice of treatment that are not directly covered in the HSS.

CAPSULE SUMMARY

- The ability of the Hemangioma Severity Scale to indicate the need for propranolol treatment is unknown.
- The Hemangioma Severity Scale score cutoff values correlating with decisions to withhold or initiate propranolol treatment were 6 or lower and 11 or higher, respectively.
- Use of the Hemangioma Severity Scale may facilitate treatment decisions for infantile hemangiomas.

METHODS

Data from patients with IH at first consultation (from September 2008 to November 2016) at our tertiary referral center were collected retrospectively. All infants between 0 and 6 months of age were included, as propranolol treatment is preferably started before the age of 6 months. The first consultation was with a pediatrician, pediatric surgeon, ophthalmologist, or dermatologist. Patients were excluded if no photographs were taken before initiation of treatment or when no documented history was available; infants treated with β-blockers before the first consultation were also excluded. Fig 1 provides an overview of the sampling procedure. HSS scores were assessed by two clinicians (B.H. and C.vdV.) by using photographs and data from the medical records.

Patients were divided into two groups, propranolol and no-propranolol, depending on the course of treatment decided by the attending physician at the first visit. Patients whose treatment regimen was changed during follow-up (eg, from topical timolol to oral propranolol) were assessed in the group to which they were primarily appointed, and only the HSS score from their first visit was used. In patients with multiple IHs, the IH with the highest HSS score was used, as were the characteristics of that specific lesion. IHs were specified on the basis of pattern (focal, multifocal, segmental, or indeterminate) and type (superficial, deep, mixed, reticular/abortive growth, or others).[8] Single IHs were described as focal or segmental; multiple IHs were described as multifocal, even when the assessed IH was segmental.

The resulting HSS scores were checked for normal distribution and compared by using the Mann-Whitney U test. Baseline characteristics and the separate clinical features of the HSS were compared by using Fisher's exact test (parametric data) or the Mann-Whitney U test (nonparametric data). P values less than .05 were considered significant. Ultimately, a receiver operating characteristic analysis was done to determine the strength of the HSS and find suitable cutoff values for possible indication of propranolol treatment. The study was approved by the local medical ethics committee. All analyses were done with SPSS software (version 22.0, IBM Corp, Armonk, NY).

RESULTS

A total of 657 patients were included in our study (Table I). Patients in the propranolol group (n = 342) were younger at first visit (P = .001) and had a deep IH component more often than in the no-propranolol group ($P < .001$).

During follow up, 58 of 315 children in the no-propranolol group (18%) switched to propranolol (switchers group), with a median (25th-75th percentile) of 34 days (range, 20-50) until indication for propranolol was determined. The median age at which propranolol was initiated was 118 days

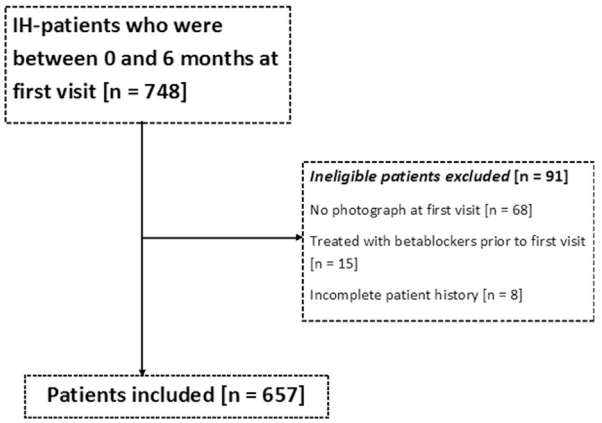

Fig 1. Sampling procedure for study evaluating the Hemangioma Severity Scale score as a tool for propranolol treatment indication. *IH*, Infantile hemangioma.