

Original Article

Clinical profile and morphologic types of infantile hemangioma. A study of 252 children

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Abstract *Background* Hemangiomas are the most common benign tumours of infancy which can affect skin as well as internal viscera. Superficial hemangiomas may show clinical diversity in sites of involvement, number, age of onset, morphology etc.

Objective The objective of present study was to record the clinical profile and morphologic types of infantile hemangiomas.

Patients and methods 252 children presenting with cutaneous hemangioma during a period of two years from January, 2003 to December, 2004 were included in the study. Their demographic characteristics, the clinical morphology, sites of involvement and complications were recorded.

Results A total of 315 lesions were observed in 252 children. Median age of presentation was 6.8 months and females outnumbered males with 2.7:1 ratio. 69.2% lesions were confined to head and neck region. Localized type of lesions (83.2%) were the most frequent presentation than segmental (15.6%) or multifocal (1.2%), usually presenting as nodules or plaques. The rate of extracutaneous hemangiomas, systemic complications or developmental anomalies was significantly low.

Conclusion Localized hemangiomas are a common occurrence during infancy and systemic complications usually do not arise.

Key words

Infantile hemangioma, localized hemangioma, segmental hemangioma, multifocal hemangioma.

Introduction

Infantile hemangiomas are the most common tumor of infancy, frequently encountered in both pediatric and dermatology practices. In the past, the

terminology has been confusing and used to describe a wide array of vascular tumors and malformations, in adults as well as children. According to the classification proposed by Mulliken,¹ hemangiomas are vascular lesions that demonstrate endothelial hyperplasia, i.e. vascular neoplasms with a proliferative and an involutonal phase, during which vascular parenchyma is replaced by fibrous tissue.

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Hemangiomas are present at birth in 2% to 3% of newborns and in up to 22% of preterm babies weighing less than 1000 g.^{2,3} Although all regions of the body can be affected by hemangiomas, 60% to 70% of them are localized on the head. Hemangiomas are also often seen on the extremities, trunk, and anogenital region.

The cause of hemangiomas is not known. The development of infantile hemangiomas has been associated with certain demographic, prenatal, and perinatal factors, including female sex (3:1), prematurity,⁴ fair skin and, a history of prenatal chorionic villous sampling.⁵ Other factors including maternal and paternal age, twinning and higher-order multiple pregnancies, and other perinatal factors are under exploration.⁶⁻⁸

Histologically, hemangiomas may involve superficial dermis (superficial or strawberry hemangiomas) or deep dermis (deep or cavernous hemangiomas). The degree of proliferation and involution and the depth of the lesion are reflected by its texture and color. They show a typical triphasic course: development during the first days and weeks of life, proliferative growth of endothelium until 12 months of age, and spontaneous regression until the onset of puberty in about 80% of children. In 20%, hemangiomas show no signs of regression; some patients require extensive cosmetic surgery.¹

Besides their negative impact on quality of life, infantile hemangiomas may be associated with a number of local or systemic complications. Similarly, other developmental anomalies may occur in addition giving rise to different syndromes.

To treat or wait for a natural outcome is a crucial decision to be made by the dermatologist. Topical, intralesional and systemic steroids, cryotherapy, interferon therapy, lasers and cosmetic surgery have been used for treatment.

The present study was undertaken to observe the clinical profile and morphologic variants in patients of infantile hemangioma in our population, since scanty local data are available addressing this subject of profound clinical and epidemiological significance.

Patients and methods

This descriptive, cross-sectional study was undertaken at the Department of Pediatric Dermatology, The Institute of Child Health/The Children's Hospital, Lahore. All infants with hemangiomas attending the outpatient and examined by the author (FM) were included in the study. The diagnosis was based on clinical appearance. A detailed medical history, with emphasis on points like maternal pregnancy history; prematurity (birth before 37 weeks), birth weight, family history of similar or other vascular lesions, previous treatment, symptoms due to lesions, systemic symptoms etc., was taken.

Physical examination included number, anatomic sites of involvement, size, mucous membrane involvement, superficial, deep or mixed lesions, and morphology of lesions. Lesions were subclassified as a) localized (confined to one anatomic region); b) segmental (linear, unilateral or involving one segment or dermatome; and c) multiple (individual, noncontiguous = 8 lesions).⁶ Morphologically, lesions were also categorized as nodules, plaques – flat

topped, plaques – telangiectatic, plaques – papular i.e. clustered papules, and other unclassifiable lesions. Complications occurring in the lesions e.g. lesional ulceration, bleeding, pain, infection, scarring, functional disability i.e. difficulty in eating, ophthalmic or auditory problems etc. were also noted. Similarly, associated abnormalities e.g. visceral hemangiomas, other developmental anomalies or systemic complications e.g. cardiac failure, purpura etc. were also looked for.

A chi-square test was used to compare the data expressed in proportions and a cut-off value of 0.05 was used for a significant *p*.

Results

In a total of 252 patients, all of Punjabi origin, a total of 315 lesions were diagnosed as hemangioma. There were 184 (73%) girls and 68 (27%) boys ($p < 0.05$), with a female to male ratio of 2.7:1. The median age of patients was 6.8 months with range of 3 weeks to 144 months. A history of premature birth (37 weeks or earlier) was available in 37 (14.7%) cases; however, information about birth weight was not available. For 158 (62.7%) children, it was the first visit to a doctor, 94 (37.3%) were referred. 184 (73%) had had the lesions since birth while 244 (97%) developed lesions within the first month of life ($p < 0.05$). A positive family history of vascular lesions was obtained in 9 (3.6%) patients.

The most commonly involved anatomic segment was cheek 85 (27%), forehead 75 (23.8%), and neck 58 (18.4%) lesions.

Mucous membranes were involved in 35 (11.1%).

Different types of lesions were categorized as localized 262 (83.2%), segmental 49 (15.6%) and multifocal 4 (1.2%) [$p < 0.05$]. **Table 1** shows the details of different morphological forms.

87 (34.5%) patients had some sort of complications as shown in **Table 2**. Difficulty in feeding was observed due to labial involvement and ocular complications due to hemangioma of upper eyelid. Systemic complications were in the form of hepatic tumours ($n=2$) and purpura ($n=1$). The single patient with developmental anomalies had hemangioma on the midline of sacral region and spinal dysraphism.

211 (83.7%) patients had used some sort of treatment including topical antibiotics 95 (45%), systemic antibiotics 73 (34.6%) and topical steroids 43 (2.4%). 37 (14.7%) had sought alternative medicine remedies.

Figures 1-6 show different morphologies, types and complications seen in our patients.

Discussion

Results of our study, based on 252 patients and 315 lesions, affirm previous reports^{3,6,10} regarding age of onset, female dominance, gestational age and anatomic distribution. However, there were certain differences in terms of rate of anomalies and systemic involvement etc.

Chorionic villous sampling is referenced as an important cause of infantile hemangioma⁵ but in our series none of patients had



Figure 1 Localized nodular type of infantile hemangioma in a year-old boy.



Figure 4 Superficial hemangioma along with deep component.



Figure 2 A smooth-surfaced plaque of segmental hemangioma in a 5-month-old female infant.



Figure 5 Papular plaques with ulceration and secondary infection in a large segmental hemangioma.



Figure 3 Multiple nodular hemangiomas on abdomen. Similar lesions were present on back, face and limbs, including palms. The infant also had hepatic vascular tumours.



Figure 6 Ocular involvement in hemangioma.

maternal history of any such procedure. Similarly, a lower proportion of our cases had history of premature delivery or family

history of vascular lesions. This signifies that many other, genetic or environmental, factors may be associated with causation of

Table 1 Different morphological variants seen in 315 lesions.

	<i>Nodules</i>	<i>Flat plaque</i>	<i>Papular plaque</i>	<i>Telangiectatic plaque</i>	<i>Others</i>
Localized (n=262)	128	39	53	15	27
Segmental (n=49)	19	6	8	4	12
Multiple (n=4)	2	1	1		
Total	149	46	62	19	39

Table 2 Local and systemic complications seen in 315 lesions.

<i>Complications</i>	<i>n (%)</i>
Ulcerations	64
Bleeding	43
Infection	24
Pain	15
Scarring	13
Inability to turn head	5
Difficulty in feeding	3
Ophthalmic complications	3
Systemic complications	3
Developmental anomalies	1

hemangioma. The incidence of infantile hemangioma may vary in different ethnic groups but incidentally, all our patients belonged to the same ethnic Punjabi origin.

We used the categorization of localized, segmental and multifocal as described by Chiller *et al.*⁶ They observed that segmental hemangiomas had significantly higher rates of complications and higher incidence of developmental anomalies, therapeutic intervention, ancillary evaluation, surgical referral, use of systemic therapies and poor outcome. Furthermore, segmental hemangiomas occurred in children born at a later gestational age with higher birth weight than in patients with other types of hemangiomas. This is in contrast to our findings. We did not observe any such association between segmental hemangiomas and gestational age, birth weight, or systemic involvement. It would be interesting to follow up such cases to see the course of events and final outcome.

Localized nodules or plaques were the most common lesions as described in the earlier studies.^{3,6,10} Morphology of the lesions depends on the stage of tumour when the patient presents to physician. Infantile hemangioma may start as a patch of erythema, bruise-like lesion or even nevus anemicus-like lesion.² During proliferative phase, the lesion changes into a nodule or plaque which depending on the depth of the lesion and proliferative activity, may be nodular or plaque of variable morphology. Similarly, if the lesion is seen during involution phase, areas of atrophy and telangiectasia may be interspersed in the plaque.

The rate of systemic complications and associated anomalies was lower than previously described. This can be due to the referral bias.^{3,6} Patients with systemic complications and serious anomalies e.g. Kasabach-Merritt syndrome, PHACES syndrome may seek advice from other medical or surgical specialties and do not present to the dermatologist. Nonetheless, large segmental hemangiomas warrant the attending dermatologist to be more vigilant to search for extracutaneous hemangiomas or developmental defects.

The rate of local complications in our study was similar to previous observations.^{3,6,10} External trauma may lead to the triad of ulceration, bleeding and secondary infection. This reinforces the view that patient education to avoid trauma to the lesions is

an essential component of the hemangioma management. Similarly, functional disabilities due to physical obstruction e.g. ears, eyes, oral cavity etc. were similar to the previous reports.^{3,6,10} These complications need an earlier intervention.

Our study concludes that infantile hemangiomas represent a common tumour of this age group. Further prospective studies are required to determine the final outcome, degree of scarring, association with systemic complications and response to different treatment modalities in different subtypes.

References

1. Mulliken JB. Classification of vascular birthmarks. In: Mulliken JB, Young AG, eds. *Vascular Birthmarks, Hemangiomas and Malformations*. Philadelphia: WB Saunders; 1988. p. 24-37.
2. Antaya RJ. Infantile hemangiomas. *eMedicine* 2005. www.emedicine.com (accessed on 15.02.2005).
3. Jacobs AH, Walton RG. The incidence of birthmarks in the neonate. *Pediatrics* 1976; **58**: 218-22.
4. Amir J, Metzker A, Krikler R, Reisner SH. Strawberry hemangiomas in preterm infants. *Pediatr Dermatol* 1986; **3**: 331-2.
5. Burton BK, Schulz CJ, Angle B, Burd LI. An increased incidence of haemangiomas in infants born following chorionic villus sampling (CVS). *Prenat Diagn* 1995; **15**: 209-14.
6. Chiller KG, Passaro D, Frieden RJ. Hemangioma of infancy. Clinical characteristics, morphologic subtypes and their relationship to race, ethnicity and sex. *Arch Dermatol* 2002; **138**: 1567-76.
7. Achauer BM, Chang CJ, Vander Kam VM: Management of hemangioma of infancy: review of 245 patients. *Plast Reconstr Surg* 1997; **99**: 1301-8.
8. Djawari J, Cremer HJ. Early contact cryosurgical treatment of haemangiomas in infancy. *Akt Dermatol* 1993; **19**: 317-21.
9. Werner JA, Lippert BM, Godbersen GS, Rudert H. Treatment of haemangiomas with Neodymium: Yttrium-Aluminium-Garnet laser (Nd:YAG laser). *Laryngorhinootologie* 1992; **71**: 388-95.
10. Finn MC, Glowacki J, Mulliken JB. Congenital vascular lesions: clinical application of a new classification. *J Pediatr Surg* 1983; **18**: 894-900.