

The aetiology of vaginal bleeding in children. A 20-year review

N. C. W. HILL, L. W. OPPENHEIMER, K. E. MORTON

Summary. The cause of vaginal bleeding in girls of 10 years and under is reviewed. Of the 52 patients seen, in 28 (54%) bleeding was caused by a local lesion and 11 (21%) of these had malignant genital tumours. Eleven (21%) children presented with some form of precocious puberty, and in 13 (25%) patients no cause could be found.

Vaginal bleeding in girls is a rare but alarming symptom, and may be caused by serious underlying pathology. All children should be investigated and examined under anaesthesia, including vaginoscopy.

This study is a review of girls aged 10 years and under who presented to the Chelsea Hospital for Women with vaginal bleeding during the past 20 years. The age of 10 was chosen as the upper limit for this study because after that time menstruation may be physiological (Dewhurst 1971; Reiter 1972). The Chelsea Hospital for Women is mainly a secondary referral centre and many girls in this series had been seen initially in other gynaecological or paediatric units; therefore this series may not represent a true cross-section of the disease spectrum.

Patients and methods

The case notes of all patients, 10 years of age and under, who presented with vaginal bleeding between 1966 and 1986 were reviewed retrospectively. Historical factors relevant to determining the aetiology of the bleeding such as oral contraceptive ingestion, duration and cyclical

nature of the bleeding were noted. Clinical examination and the presence or absence of secondary sexual characteristics were recorded. All patients were examined under anaesthesia. Vaginoscopy was performed in small infants using a cystoscope or hysteroscope; in larger infants direct inspection of the vagina and cervix was achieved by passing a paediatric laryngoscope. The final diagnosis, subsequent management and follow-up were also noted.

Results

Overall, 52 girls were seen during the study period; their age range was 7 months to 10 years (Table 1) (mean 4.75 years). The aetiology of the vaginal bleeding is shown in Table 2. In 28 girls (54%) bleeding was from a local lesion and in 11 of them (21%) bleeding was due to a malignant genital tract tumour. Eight were rhabdomyosarcomas (botryoid sarcoma); two were clear-cell vaginal adenocarcinomas and one was an endodermal sinus tumour.

Three of these 11 children with tumour died during the study period. The first was a 19-month-old Egyptian girl who had vaginal bleeding for over a year before being seen. At operation she had a large inoperable clear-cell adenocarcinoma which failed to respond to radiotherapy. The second was a 2-year-old girl with a rhabdomyosarcoma who presented with a 6-month history of blood-stained discharge. A biopsy at another hospital was reported as showing inflammatory changes only. She received high-dose chemotherapy, but at subsequent laparotomy was found to have an inoperable

**The Chelsea Hospital for Women, Dovehouse Street,
London SW3 6LJ**

N. C. W. HILL *Senior House Officer*

L. W. OPPENHEIMER *Senior House Officer*

K. E. MORTON *Registrar*

Correspondence: Mr N. C. W. Hill, Clinical Research Fellow, Nuffield Department of Obstetrics and Gynaecology, John Radcliffe Hospital, Headington, Oxford OX3 9DU

Table 1. Age at presentation

Age (years)	No. of girls
0-1	6
1-2	7
2-3	4
3-4	2
4-5	8
5-6	5
6-7	3
7-8	4
8-9	2
9-10	5
10	6

tumour. The third was a 16-month-old girl who presented with a 1-week history of vaginal bleeding, but despite an anterior excision for a yolk sac tumour, radiotherapy and chemotherapy, she died. The other eight girls are alive and disease free at follow-up, 5-18 years later.

In five children vaginal bleeding was secondary to a vulval lesion. This was lichen sclerosis in two, vulval warts in another two, and a cavernous haemangioma in the fifth. In a further five children vaginal bleeding was secondary to urethral prolapse. Four girls presented with trauma causing vaginal bleeding; three of these followed various types of falls, and the last had a ruptured hymen possibly linked to a previous foreign body. In three children bleeding was due to vulvo-vaginitis.

Vaginal bleeding was caused by some form of precocious puberty in 11 children. Precocious puberty was constitutional in two girls, and in three others pseudo-precocious puberty was associated with a granulosa cell feminizing tumour. In the six remaining girls cyclical bleeding was the only sign of precocious puberty and so a diagnosis of premature menarche was made. None of the children had evidence of McCune-Albright syndrome.

In the remaining 13 girls (25%) no clear cause could be found.

Discussion

Where a definite diagnosis was made, the commonest aetiological causes were malignant genital tumours ($n = 11$) and precocious puberty ($n = 11$). The high frequency of malignant tumours may reflect the secondary referral role of the Chelsea Hospital for Women. Most of the tumours were rhabdomyosarcomas which are

mixed mesodermal tumours. They may be found at any age during childhood, but are more common in children under 3 years of age (Dewhurst 1983). The vagina is the commonest site of the tumour in the young, but the cervix may also be involved. The appearance of the tumour may vary but classically it resembles a bunch of grapes. The tumour usually presents with vaginal bleeding which may be accompanied by the passage of a piece of tumour tissue. Sometimes the tumour may be visible at the vaginal orifice, but examination under anaesthesia and biopsy is usually necessary to make the diagnosis. Occasionally histological diagnosis may be difficult due to the pleomorphism of the tumour. Histological misdiagnosis may result in delayed treatment, as unfortunately occurred in the 2-year-old girl who died. Early cases in the series were treated surgically, but the more recent ones have been treated with chemotherapy.

Two children in the present series presented with clear-cell adenocarcinomas. Neither of them had been exposed to diethylstilboestrol (DES) *in utero*. The association between these tumours and DES was first described by Herbst & Scully (1970). The risk of developing clear-cell adenocarcinoma after exposure to DES has been estimated to be 0.14-1.4/1000 of DES-exposed females (Emens 1984). Both girls were treated with extended hysterectomy, vaginectomy and radiotherapy. During the study period a 13-year-old girl who had been exposed to DES *in utero* did present with a clear-cell adenocarcinoma. She was successfully treated with radiotherapy (Dewhurst & Ferreira 1980). The exact place of chemotherapy in the management of these tumours is as yet unknown.

Endodermal sinus tumours of the vagina are the rarest vaginal tumours in this age group, and are also some of the most malignant. Only one

Table 2. Aetiology of vaginal bleeding

	Number	(%)
Genital tumours	11	(21)
Precocious puberty	11	(21)
Vulval lesions	5	(10)
Urethral prolapse	5	(10)
Trauma	4	(8)
Vulvo-vaginitis	3	(6)
Unknown aetiology	13	(25)
Total	52	(100)

girl was diagnosed as having this tumour and she was treated surgically (Dewhurst & Ferreira 1981).

Precocious puberty is defined as the appearance of physical signs of secondary sexual development before the age of 8 years or of menstruation before the age of 10 years (Dewhurst 1971). Pseudoprecocious puberty may be caused by feminizing granulosa cell ovarian tumours. Classically, bleeding presents early and unlike other causes of precocious puberty the bone age is not in advance of chronological age (Dewhurst 1980). The diagnosis is made by detection of a mass, and endocrine investigations show high oestrogen levels. In most of our girls with precocious puberty, cyclical bleeding occurred without other signs of secondary sexual development. This is classified as premature menarche and is thought to be due to unusual sensitivity to very low levels of circulating oestrogen (Heller *et al.* 1983). Hormone assays are normal and the bone age corresponds with the chronological age. No treatment is required once a more serious cause has been excluded. The bleeding usually stops by 10 years of age and starts again after the appearance of the other signs of secondary sexual development. Subsequent development of such patients appears to be normal, as is their future fertility (Murran *et al.* 1983). Exogenous oestrogen ingestion in the form of the oral contraceptive pill or in the diet should be excluded (Comas 1982; Schoental 1983). Two girls had constitutional precocious puberty which is attributed to spontaneous initiation of hypothalamic and pituitary activity. It presents with cyclical bleeding in association with other signs of secondary sexual development. Both girls in this series had radiographic signs of advanced bone age and breast development before menstruation.

A variety of vulval lesions may affect the young child, but few cause vaginal bleeding. Lichen sclerosis was diagnosed in two children. This disorder is similar to the condition which affects postmenopausal women and it usually disappears at puberty (Dewhurst 1984). Genital warts may cause bleeding occasionally and their presence may suggest infection by a parent or sexual molestation. This was not evident in either of our children.

Urethral prolapse is a relatively common mistaken cause of 'vaginal' bleeding in children and was found in 10% of our series. It occurs most often at between 5 and 9 years of age (Editorial

1979). It is more common in children of negroid extraction (Klaus & Stein 1973). Urethral prolapse may be related to low levels of oestrogens and presents with a circular prolapse at the external urethral orifice. Occasionally the prolapse may be difficult to distinguish from a genital tumour. If the prolapse is large it is best treated by surgical excision of the necrotic mucosa.

If bleeding is associated with trauma, examination under anaesthesia is necessary because lacerations of the vulva may appear relatively minor on external inspection and external blood loss may be deceptively small in the presence of significant vaginal haematoma (Heller *et al.* 1978). Although no cases of trauma associated with a foreign body were found in this study it has been reported to cause up to 30% of vaginal bleeding in children (David *et al.* 1984).

Vaginitis and vulvo-vaginitis, although quite common, rarely cause vaginal bleeding. It occurred in only 3 (6%) children in this series.

In all the 52 children seen with vaginal bleeding during the study period no case of sexual abuse was confirmed. However, it may be that these unfortunate children tend not to be referred to secondary centres.

Conclusion

Vaginal bleeding in children is a rare occurrence, and a serious underlying cause should always be excluded. Examination under anaesthesia and vaginoscopy are mandatory in all cases. Few series have been published, and the incidence of various aetiologies differs widely between studies. The numbers of patients seen by any clinician are small, so it is preferable that the children be referred to specialized centres.

Acknowledgments

We wish to express our gratitude to Professor Sir John Dewhurst for his permission to report these cases.

References

- Comas A. P. (1982) Precocious sexual development in Puerto Rico. *Lancet* **i**, 1299-1300.
- David L., Betand B., Berlier P., Evard A., Guinard A. & Francois R. (1984) Les hemorrhagies genitales de la fille avant la puberté. *Ann Pediatr* **31**, 55-61.
- Dewhurst J. (1971) Gynaecological disease in childhood. *Update* **3**, 549-570.

- Dewhurst J. (1980) *Practical Paediatric and Adolescent Gynaecology*. Marcel Dekker, New York, pp. 65-70.
- Dewhurst J. (1983) Botryoid sarcoma of the cervix and the vagina in children. In *Progress in Obstetrics and Gynaecology Vol. 3* (Studd J., ed.), Churchill Livingstone, London, pp. 151-158.
- Dewhurst J. (1984) Disorders of the vulva in childhood. *Br J Sexual Med* **2**, 49-53.
- Dewhurst J. & Ferreira H. P. (1980) Stilboestrol-associated vaginal carcinoma treated by radiotherapy. *J Obstet Gynaecol* **1**, 63-64.
- Dewhurst J. & Ferreira H. P. (1981) An endodermal sinus tumour of the vagina in an infant with seven year survival. *Br J Obstet Gynaecol* **88**, 859-862.
- Editorial (1979) Urethral prolapse in childhood. *Br Med J* **ii**, 240.
- Emens M. (1984) Vaginal adenosis and diethylstilboestrol. *Br J Hosp Med* **1**, 42-48.
- Heller M., Savage M. & Dewhurst J. (1978) Vaginal bleeding in children. *Br J Obstet Gynaecol* **85**, 721-725.
- Heller M., Dewhurst J. & Grant D. (1983) Premature menarche without the evidence of precocious puberty. *Arch Dis Child* **58**, 472-475.
- Herbst A. L. & Scully R. (1970) Adenocarcinomas of the vagina in adolescence: A report of seven cases including six clear-cell carcinomas. *Cancer* **25**, 745-757.
- Klaus M. & Stein R. T. (1973) Urethral prolapse in young girls. *Pediatrics* **52**, 645-648.
- Murran D., Dewhurst J. & Grant D. (1983) Premature menarche: A follow-up study. *Arch Dis Child* **58**, 142-143.
- Reiter E. O. (1972) Sexual maturation in females—normal development and precocious puberty. *Pediatr Clin North Am* **19**, 581-603.
- Schoental R. (1983) Precocious sexual development in Puerto Rico and oestrogenic mytotoxins. *Lancet* **i**, 537.

Received 27 June 1988

Accepted 29 July 1988