

# An audit of dermatology in a paediatric accident and emergency department

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## SUMMARY

Two studies were undertaken of patients with dermatological disorders who attended the Accident and Emergency (A&E) Department of the Royal Belfast Hospital for Sick Children during 1990–1991. The aims were to review diagnostic accuracy and assess the benefits of an open-access consultant dermatology clinic.

A retrospective survey of 14 340 new attendances at the A&E department over a 7-month period found that 540 of these (4%) had a primary dermatological disorder. In 26% no diagnosis had been made although only 10% were referred for a specialist opinion. A 2-month prospective study of patients who attended the department and were referred to a consultant dermatology open-access clinic revealed overall diagnostic accuracy of 66% ( $\pm 2$  SEM). Individual rates of diagnostic concordance between junior doctor and consultant were 59% for skin infections and 77% for papulosquamous disorders. The open-access clinic allowed prompt referral for correct diagnosis and initiation of appropriate management.

**Key words:** audit, dermatology, paediatric A&E

## INTRODUCTION

It is thought three million children attend A&E departments annually in the United Kingdom,<sup>1</sup> which is two to three times as many as attend out-patient clinics. A recent survey of one year's new attendances at this centre found that more than 60% of patients had a medical or surgical disorder, of whom 7% had a primary dermatological disorder (DD).<sup>2</sup> However, most of the junior doctors dealing with these patients have not had supervised training or experience in dermatology.

The objective of this study was therefore to survey patients who attended a paediatric A&E department

with a DD, in order to audit diagnostic accuracy and determine the benefits of an open-access consultant dermatology clinic with the aim of improving the clinical service.

## METHODS

These studies took place between September 1990 and March 1991 at the A&E department of a children's hospital which is situated in a socially deprived inner-city area with high rates of unemployment, poor educational achievement and single parent families. From 6 August 1990 to 5 August 1991 there were 24 648 new attendances by children of less than 13 years of age. The department, which is the only paediatric A&E unit in Northern Ireland, is staffed by a part-time consultant paediatrician (0.5 WTE) and three full-time and one part-time junior medical staff. Two studies were carried out.

We reviewed retrospectively 14 340 consecutive new attendances over a 7-month period. Patients with DD were identified, diagnoses by junior doctors reviewed and initial referral patterns determined.

A prospective study was designed to validate the diagnoses made by junior medical staff and to assess the benefits of an open-access dermatology clinic. Over a 2-month period, staff were asked to refer *all* patients thought to have a DD to the next consultant clinic, stating their preliminary diagnosis in the letter of referral. Open-access clinics were held daily and most patients were seen on the same or the following day.

## RESULTS

### *Retrospective survey*

Five hundred and forty new attendances (4% of all new attendances) were identified as presenting with a primary DD, only 7% of whom were referred by

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	Retrospective study	Prospective study	
	Number (%)	Junior doctor Number (%)	Consultant Number (%)
Infections	185 (34)	22 (26)	34 (41)
Papulosquamous	82 (15)	28 (34)	31 (38)
Urticaria and toxic erythema	57 (11)	8 (10)	11 (13)
Miscellaneous	75 (14)	10 (12)	7 (8)
No diagnosis	141 (26)	15 (18)	0 (0)
Total	540 (100)	83 (100)	83 (100)

**Table 1.** Results of both the retrospective survey by dermatological category and a comparison of junior doctor and consultant diagnoses in the prospective study

the general practitioner (GP); the rest were parent referrals. The diagnoses, which were made largely by the junior staff, are shown in Table 1; acute or chronic infections were the largest group (185), 15% (82) were thought to have a papulosquamous disorder (atopic eczema, seborrhoeic eczema, napkin dermatitis or psoriasis) and 11% (57) had an urticarial or toxic erythematous disorder (for example, Henoch Schonlein purpura, erythema multiforme). The second commonest group of disorders (26%) were those in whom a specific diagnosis was not made. The final miscellaneous group of 14% (75) included, for example, such diagnoses as sunburn reactions, benign naevi, pyogenic granuloma and bleeding strawberry naevi. Overall, only 10% (54) were spontaneously referred to a consultant clinic, the rest being managed in the A&E department. Ten per cent of the 141 undiagnosed patients were referred.

#### Prospective study

During the 2-month study period, 83 patients with DD were referred from the A&E department to an open-access clinic for validation of the diagnosis. Table 2 illustrates the age and sex distribution. Seventy-two per cent (60) occurred in pre-school children, almost three times the number in those aged 5–13 years. Sex distribution was equal in all age groups with the exception of infancy where males predominated in a ratio of 2:1.

The diagnoses made by junior doctors in the A&E department and the consultant dermatologist have been compared (Table 1). Infections tended to be under-represented in junior doctors' diagnoses (26%) compared with 41% of these by the consultant. Of the 15 patients in whom no diagnosis was made by the junior doctor, seven were thought by the

consultant to have an infection and six a papulosquamous disorder. Using these data a table of concordance (Table 3) has been constructed in which the principal diagonal represents diagnostic concordance in each dermatological group. Twenty patients were thought by the junior staff to have an infection and 34 by the consultant; hence the concordance rate was 20/34 or 59%. The concordance of diagnosis for papulosquamous disorders was 77% (24/31). In view of the small numbers in the other diagnostic groups the concordance rate is less valid. The overall rate of concordance between the junior doctor and consultant diagnoses was 66% (55/83) ( $\pm 2$  SEM).

Although 83 patients were referred to consultant clinics during the study period, a further 23 were considered to have either very minor DD or referral was overlooked; seven were thought to have napkin dermatitis, five urticaria, four each herpes stomatitis or a viral exanthem.

**Table 2.** Age and sex distribution of 83 referrals to the open-access dermatology clinic

Age (years)	Male	Female	Total
<1	15	7	22
2–5	19	19	38
6–9	6	5	11
10–13	6	6	12
Total	46	37	83

## DISCUSSION

Audit is increasingly regarded as an important component of medical practice.<sup>3</sup> It has been stressed that audit should be educational and reflect actual

**Table 3.** Diagnostic concordance in 83 patients referred from the A&E department to a consultant open-access clinic

Junior doctors diagnoses	Consultant diagnoses					Total
	Infections	Papulosquamous	Urticaria	Miscellaneous	No diagnosis	
Infections	20 (59%)*	1	0	1	0	22
Papulosquamous	3	24 (77%)*	0	1	0	28
Urticaria	2	0	6 (55%)*	0	0	8
Miscellaneous	2	0	3	5 (71%)*	0	10
No diagnosis	7	6	2	0	0 (0%)*	15
Total	34	31	11	7	0	83

[\* ( $\pm 2$  SEM)]

rather than abstract practice.<sup>4</sup> The purpose of this audit was to evaluate diagnostic accuracy of DD by junior medical staff in an A&E department.

The 7-month retrospective survey determined that patients with DD accounted for 4% of those attending the unit, most commonly in the 2- to 5-year-old age group. Ninety-three per cent of these attendances were parent referrals. This is much higher than in an earlier study of all new attendances carried out in this department where parent referrals accounted for 69% of a 4% random sample of 22617 patients;<sup>5</sup> more recently this figure was 77%.<sup>2</sup> The very high proportion of parent referrals may also reflect the worry and embarrassment that often accompanies DD which drives parents to seek immediate help. In general, however, the parent referrals have a significantly higher proportion of inappropriate attenders,<sup>4</sup> which places an unnecessary burden upon hospital services, when in many cases satisfactory management could have been provided by their GP.<sup>2,4,5</sup>

The retrospective survey also revealed that although in 26% the junior staff did not make a definite diagnosis, only 10% of these were referred for a specialist opinion. In addition, the overall referral rate for a second opinion was equally low (10%). In the prospective study, individual diagnostic concordance for infections was only 59% ( $\pm 2$  SEM) (Table 3). It is important to find effective ways of improving the performance of junior staff by in-service education, and because infections accounted for 41% of all cases seen but were most often misdiagnosed or under-diagnosed (Table 3), easily accessible pictorial examples in A&E of common infective conditions such as impetigo may be helpful.

Hunt and Glucksman have reviewed the complaints made about treatment received at an inner-city A&E department over a 7-year period.<sup>6</sup> In over

one-third of patients missed diagnoses were an important aspect, which, at a time of increasing litigation,<sup>7</sup> reinforces the desirability for diagnostic precision. As a result of this audit, particular attention to DD is being given during induction courses for A&E junior doctors together with the provision of an open-access consultant clinic to which immediate referrals should be made. The value of such a service is illustrated by two patients seen during the prospective study. One patient was thought to have cigarette burns, possibly as a result of child abuse. A dermatologist, however, considered bullous impetigo more likely and bacteriological cultures tended to confirm this. In a second patient, referral of a child with an 'eczematous rash' led to a diagnosis of Kawasaki disease. In such patients the implications for misdiagnosis can be serious and far reaching.

This audit has demonstrated several benefits of an open-access dermatology clinic. It encourages junior A&E staff to seek prompt specialist advice for both diagnosis and management. In addition, the 'feedback' in the form of a letter, sent following the consultation to the referring A&E doctor is an important specific educational component. Furthermore, many of the patients with papulosquamous disorders who attended the unit during the prospective study, were neither accidents or emergencies. Their concerns had either not been addressed or had been only partially relieved by their GP. These families clearly needed a specialist opinion in order to gain a more complete understanding of the disorder and its management, and an open-access dermatology clinic is a more appropriate setting to deal with these anxieties fully.

In practical terms, the referrals from A&E to the open access clinics required no increase in out-patient staffing levels and as these patients were

seen at the end of each clinic or if time became available during the clinic, the waiting time for routine appointments was not affected. We feel therefore that this system with only minimal extra cost, has provided an enhanced service for patients, as well as additional postgraduate education for junior doctors in paediatric dermatology.

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