Focus on the Top Ten Diagnoses Could Reduce Pediatric Dermatology Referrals

Abstract: There is a sense that many patients seen at referral centers could be managed at a primary health care level. The objective of the current study was to examine the range of diagnoses among consultations at the Red Cross Children’s Hospital in Cape Town, South Africa, to help develop a strategy for targeted education of primary health care personnel. This was a retrospective review of data for children seen at a pediatric dermatology clinic from 2005 to 2010, recorded according to International Classification of Diseases coding and compared with published data from similar clinical settings. There were 13,253 clinic visits, with 4,789 patients seen (median age 4.8 yrs, range 2 days to 18.6 yrs). The top 10 diagnoses accounted for 88.5% of consultations (59.5% atopic eczema [AE], 7.1% seborrheic dermatitis [SD], 4.2% superficial mycoses, 3.1% molluscum contagiosum, 2.8% vitiligo, 2.7% viral warts, 2.4% prurigo or scabies, 2.3% psoriasis, 2.3% hemangioma, 2.1% impetigo). Disease prevalence was somewhat different during the first year of life (AE 43.7%, SD 18.6%, hemangiomas 13.4%). Inflammatory dermatoses (76.6%) were more prevalent than infections and infestations (14.5%). The disease spectrum was similar to that in developed countries, although AE prevalence was higher in this study (followed by London 36%, Greece 35%, and Hong Kong 33%) than in 19 published studies. The top 10 diagnoses accounted for more than 70% of diagnoses in 12 studies. The retrospective nature and setting at a specialist clinic increased bias and limited generalizability. Focused education on the optimal care of common diseases, especially AE, could reduce referrals, improve access, and allow specialists at tertiary centers more time to manage complex and uncommon dermatoses.

In developed countries, skin diseases constitute up to 21% of general practice (GP) outpatient visits (1), while in developing countries they account for 11.7% (2) to 28.6% (3), but it is estimated that 35.25% to 96.8% of children have at least one untreated dermatosis, most being infections and infestations (3–9).

Of nine South African studies identified that were conducted in dermatology clinics and published between 1957 and 1975, four reported dermatoses in children (10–13). Findlay and Scott (10) studied children younger than 3 years of age from a private practice; four diseases accounted for 70% of diagnoses, with atopic eczema (AE) and seborrheic dermatitis (SD) being most common (42%). Next most common were papular urticaria (14%), scabies (6.5%), and infective pyodermas (6.5%). The two studies that included African children did not quantify prevalence but reported scabies and impetigo (13) and bacterial infections and eczema (12), respectively, as the most-common diseases. Findlay et al (11) reported the prevalence of AE (18.7%), verruca vulgaris (10.7%), and impetigo (7.8%).

The Red Cross War Memorial Children’s Hospital is currently South Africa’s only hospital dedicated to children, offering a comprehensive range of specialist services at a tertiary level. In 1990, skin diseases were reported as the fifth most common reason for referral to the outpatient department (14). The general dermatology clinic is held twice a week; subspecialist clinics (hair, blistering, and keratinizing disorders) rotate once a month. One specialist runs the service and oversees dermatology specialist trainees. Anecdotal evidence suggested that the majority of attendees had skin conditions that properly trained primary care physicians could easily treat.

AIM

The aim of the current study was to identify the age distribution of children attending a specialist skin clinic and to compare the pattern of the top 10 diagnoses with published international data from similar clinical settings.

METHODS

Records of all children who attended the dermatology outpatient clinic between December 2005 and December 2010 were obtained from the hospital electronic database. The diagnoses are recorded by clinicians using the International Classification of Diseases coding system. Tabulations were for number of visits and dermatoses per year, categorized according to sex and age group (<1, 1–5, 6–10, ≥10 yrs). The main diagnosis was recorded.
PubMed and Embase databases were searched for all “disease prevalence” studies that included data on “children” seen at “dermatology” or “skin” clinics up to December 2012.

Statistical analyses were performed using STATA version 12 (StataCorp, College Station, TX). Excel (Microsoft, Redmond, WA) was used to generate the graphs of the distributions of the of top 10 skin diagnoses. Differences in the distribution of the top 10 diagnoses according to age were assessed using chi-square or Fisher exact tests. All significance tests were two-tailed and significance was defined at the 5% level.

RESULTS

The number of dermatology visits was second only to the number attending the general pediatric clinic. During the 5-year period, there were 13,253 visits to dermatology by 4,789 patients. The median age of children was 4.8 years (range 2 days to 18.6 yrs) and 52% were female. The top 10 diagnoses accounted for 87.9% (4,208/4,789) of patients seen and 88.4% of the 13,253 visits. The top five diagnoses accounted for 76.7% of patient diagnoses: AE (59.5%), SD (7.1%), superficial mycoses (4.2%), molluscum contagiosum (3.1%), and vitiligo (2.8%). The next five most common diseases were viral warts, scabies, psoriasis, hemangioma, and impetigo, which together accounted for 11.8% of patients. Patients with AE were seen an average of three times each, and approximately 10 times as much AE was seen as each of the other common diseases (Fig. 1). The contribution of AE to total diagnoses changed with age, being lowest in infants (43.7%) and highest (67.3%) in 1- to 5-year-olds (p < 0.001) (Table 1). The prevalence of AE declined after age 5, consistent with disease improvement with age noted in other studies.

A diagnosis of SD initially decreased with age but then increased again after age 10. Scabies and impetigo did not change significantly with age, but superficial fungal infections, viral warts, and vitiligo all increased noticeably with age (Table 1). Molluscum and psoriasis initially increased but then decreased after age 5. Hemangiomas were seen mainly in infancy and were the third most common diagnosis in that age group. The sex difference was highest for hemangiomas (female 74% [221/298], p < 0.001).

Inflammatory dermatoses (74.3%; AE, SD, psoriasis) were more prevalent than infections and infestations (14.5%; fungal infection, molluscum, viral warts, scabies, impetigo).

The literature review identified 19 studies from 16 countries [Egypt (7), India (8,15,16), Kuwait (17), United Kingdom (18), Saudi Arabia (19), Mali (2), Hong Kong (20), Greece (21), Pakistan (22), Jordan (23), Nepal (24), Mexico (25), Turkey (26,27), Ethiopia (28), Spain (29), and Switzerland (30)]. Although there was variation in disease prevalence, infections and infestations were more common in developing countries (2,7,16,23–25), and the top 10 diagnoses accounted for more than 70% (8,15–18,20,21,23,24,27) of consultations in 12 studies.

Figure 1. Top 10 dermatoses by visit numbers for 2005–2010.
and more than 50% (7,19,26,28–30) in 6 studies. The study from Mexico had the lowest total top 10 diagnoses (48.2%) (25).

**DISCUSSION**

In spite of geographic variation in disease spectrum between rural versus urban or developed versus developing countries, the top 10 dermatoses constituted the majority of diseases in all studies. There are variations between developed and developing countries, with a predominance of inflammatory disease over infection and infestation in developed countries.

Although this study reports a pediatric disease burden similar to that of developed countries, South Africa is classified as a developing country with an emerging economy. The demographic characteristics of patients attending a tertiary hospital based in a big city may partly explain our findings. It is possible that the pattern of disease would be different in a more rural community.

The prevalence of AE in Cape Town children was reported to increase from 8.3% (31) to 13.3% (32) in the International Study of Asthma and Allergies in Childhood 1 and 2, conducted 7 years apart. Cape Town also has a higher prevalence of AE outpatient visits than published data. [One from Turkey reported AE within allergic diseases at 49.9%, London 36% (18), Greece 35% (21), and Hong Kong 33% (20).] In the current study, AE accounted for the largest number of consultations. SD was highest in infants, initially decreased with age, and then increased after age 5. HIV status is not entered in our hospital database. It was thus not possible to confirm whether this influenced disease burden, although, consistent with the U.S. Agency for International Development estimates of 460,000 (range 410,000–520,000) children ages 0 to 14 years living with HIV in Cape Town during the study period, HIV may have explained the SD prevalence.

Finally, focused education of primary health care providers, directed at the top 10 diagnoses, could improve access and free up clinic time to allow appropriate management of complex dermatoses at tertiary centers. In the United Kingdom, nurse-led clinics and trained general practitioners manage the majority of mild to moderate AE (33). In our setting, an initial focus on AE alone and its appropriate management at peripheral clinics could significantly reduce the number of hospital referrals.

**REFERENCES**


**TABLE 1. Top 10 Diagnosed Diseases According to Age, 2006–2010**

<table>
<thead>
<tr>
<th>Disease</th>
<th>&lt;1</th>
<th>1–5</th>
<th>6–10</th>
<th>&gt;10</th>
<th>Total</th>
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<tbody>
<tr>
<td>Atopic dermatitis</td>
<td>537</td>
<td>3828</td>
<td>2598</td>
<td>924</td>
<td>7,887</td>
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<tr>
<td>Seborrhoeic dermatitis</td>
<td>228</td>
<td>414</td>
<td>196</td>
<td>100</td>
<td>938</td>
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<tr>
<td>Superficial mycoses</td>
<td>22</td>
<td>83</td>
<td>222</td>
<td>234</td>
<td>561</td>
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<tr>
<td>Molluscum contagiosum</td>
<td>46</td>
<td>222</td>
<td>113</td>
<td>26</td>
<td>407</td>
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<tr>
<td>Vitiligo</td>
<td>2</td>
<td>85</td>
<td>202</td>
<td>82</td>
<td>371</td>
</tr>
<tr>
<td>Viral warts</td>
<td>1</td>
<td>93</td>
<td>181</td>
<td>78</td>
<td>353</td>
</tr>
<tr>
<td>Scabies or prurigo</td>
<td>12</td>
<td>77</td>
<td>162</td>
<td>73</td>
<td>324</td>
</tr>
<tr>
<td>Impetigo</td>
<td>46</td>
<td>134</td>
<td>72</td>
<td>30</td>
<td>282</td>
</tr>
<tr>
<td>Psoriasis</td>
<td>5</td>
<td>160</td>
<td>118</td>
<td>15</td>
<td>298</td>
</tr>
<tr>
<td>Hemangiomas</td>
<td>165</td>
<td>113</td>
<td>18</td>
<td>2</td>
<td>298</td>
</tr>
<tr>
<td>Other</td>
<td>164</td>
<td>480</td>
<td>554</td>
<td>336</td>
<td>1,534</td>
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<tr>
<td>Total</td>
<td>1,228</td>
<td>5,689</td>
<td>4,436</td>
<td>1,900</td>
<td>13,253</td>
</tr>
</tbody>
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