Patterns of referral to the paediatric specialist clinic of a regional hospital: descriptive study

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Objective. To study the patterns of referral to a paediatric specialist out-patient clinic.
Design. Descriptive study.
Setting. Regional hospital, Hong Kong.
Patients. The 1985 referral letters of patients who were referred to the paediatric specialist clinic during 1998 were studied.
Main outcome measures. Common referral diagnoses according to sources of referral.
Results. The common sources of referral were maternal and child health centres (34.7%), accident and emergency departments (26.9%), the Student Health Service (12.9%), private practitioners (10.5%), and general out-patient clinics (9.8%). The common referral diagnoses from maternal and child health centres (n = 689) were growth problems (37.7%), heart murmurs (16.8%), and neonatal jaundice (10.9%). Asthma or suspected asthma constituted the majority of referrals from accident and emergency departments (227/533; 42.6%). Deviations in growth (41.4%), problems regarding puberty (13.7%), apparent heart problems (13.3%), and nocturnal enuresis (11.7%) were the common referral diagnoses from the Student Health Service (n = 256).
Conclusion. Studying referral patterns from various sources is helpful in organising medical services and identifying training needs.

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Key words: Child; Outpatient clinics, hospital/utilization; Referral and consultation/statistics & numerical data

Introduction

The specialist out-patient clinic represents a significant portion of the workload of paediatric services in regional hospitals in Hong Kong. The majority of attendances are previous cases that have established diagnoses and treatment plans. The impact of new cases should not be ignored, as the time spent on a new case could be two to three times that of an old case. Reducing the waiting time for new cases has always been a concern of the community, the Hospital Authority, and specialists in Hong Kong. Knowledge of the referral patterns to specialist out-patient clinics facilitates better planning of out-patient services. Conversely, the referring parties will be able to identify their training needs. The referral pattern also provides some background information to all parties concerned, so that medical care is delivered more effectively and efficiently. These improvements are particularly important now, when resources for health care are limited.

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Methods

All referral letters received in 1998 by the paediatric specialist clinic of the Pamela Youde Nethersole Eastern Hospital (PYNEH) were included in this study. All letters were screened initially by a nurse and subsequently by a doctor to enable an appointment to be given at the appropriate subspecialty clinic at the appropriate time. During the screening, referral diagnoses and sources of referral were recorded for later analysis. Relatively uncommon referral diagnoses (including surgical or dermatological problems) that did not fall into the common categories were classified as 'others'. For cases with multiple problems, only the most important problem was included for analysis.

Results

A total of 1985 referral letters were received over the 1-year study period. The sources of referral in descending order of frequency were maternal and child health centres (MCHCs) [34.7%], accident and emergency departments (26.9%), the Student Health Service (12.9%), private practitioners (10.5%), general out-patient clinics (9.8%), and other specialties or

Table 1. Referrals from maternal and child health centres

Reason for referral	Referrals* No. (%)
Growth problems	
anterior fontanelle (too small or too large)	71 (10.3)
failure to thrive, poor growth, shortness, or smallness	64 (9.3)
big head	35 (5.1)
small head	28 (4.1)
other head problems (abnormal shape or bony prominence)	22 (3.2)
largeness or obesity	21 (3.0)
tallness	19 (2.8)
Subtotal	260 (37.7)
Heart problems	
murmur	116 (16.8)
other	1 (0.1)
Subtotal	117 (17.0)
Neonatal jaundice	75 (10.9)
Neurological problem or delayed development	54 (7.8)
Sacral dimple	35 (5.1)
Thelarche	20 (2.9)
Labial adhesion	15 (2.2)
Others	113 (16.4)
Total	689

* Percentage subtotals and totals (in this Table and subsequent Tables) may not add up correctly due to rounding

paediatric departments (5.2%). The referral diagnoses from the first five sources are shown in Tables 1 to 5. The three most common diagnoses for MCHC referrals were growth problems (mainly deviations from standard growth charts), heart murmurs, and neonatal jaundice (Table 1). Known cases of asthma or suspected asthma in the form of cough or wheeze constituted 42.6% of all referrals from accident and emergency departments (Table 2). For referrals from the Student Health Service, deviations from standard growth curves (particularly obesity and shortness) were the most common reasons for referral (Table 3). Other reasons included precocious puberty, heart murmur, and nocturnal enuresis. The patterns of referral from private practitioners (Table 4) and general out-patient clinics (Table 5) were similar, and the common referral diagnoses were asthma or cough, and neurological and cardiac problems. The referrals from all sources are summarised in Table 6. Overall, the most common reasons for referral were related to growth (20.5%), respiration (17.4%), and the heart (11.9%).

Table 2. Referrals from accident and emergency departments

Reason for referral	Referrals No. (%)
Asthma, cough, or wheeze	227 (42.6)
Abdominal pain	39 (7.3)
Neonatal jaundice	34 (6.4)
Urinary tract infection (suspected or confirmed)	29 (5.4)
Headache	17 (3.2)
Palpitations or arrhythmia	14 (2.6)
Dizziness	12 (2.3)
Growth problems	12 (2.3)
Chest pain	10 (1.9)
Others	139 (26.0)
Total	533

Discussion

Because this study was based on the contents of referral letters, it was not possible to tell whether the referral diagnoses were substantiated or whether the referrals were justified. Nevertheless, the study reflects the practice of the various sources of referral and provides information that can be used to improve referral procedures and staff training. No previous

Table 3. Referrals from the Student Health Service

Reason for referral	Referrals No (%)
Growth	
obesity	38 (14.8)
shortness	32 (12.5)
tallness	19 (7.4)
decreased growth rate	9 (3.5)
thinness	8 (3.1)
Subtotal	106 (41.4)
Puberty	
precocious	29 (11.3)
delayed	6 (2.3)
Subtotal	35 (13.7)
Heart problems	
murmur	25 (9.8)
palpitation, arrhythmia, or chest pain	9 (3.5)
Subtotal	34 (13.3)
Nocturnal enuresis	30 (11.7)
Others	51 (19.9)
Total	256

Table 4. Referrals from private practitioners

Reason for referral	Referrals No. (%)
Asthma, cough, or wheeze	36 (17.2)
Neurological problems (delayed development, speech problem, convulsion, or headache)	27 (12.9)
Heart murmur, palpitation, or chest pain	26 (12.4)
Growth problems	19 (9.1)
Behavioural or psychological problems	14 (6.7)
Urinary tract infection (confirmed or suspected)	13 (6.2)
Nocturnal enuresis	9 (4.3)
Others	65 (31.1)
Total	209

Table 5. Referrals from general out-patient clinics

Reason for referral	Referrals No. (%)
Asthma or cough	24 (12.3)
Neurological problems (delayed development, speech problem, convulsion, or headache)	26 (13.3)
Heart murmur, palpitation, chest pain, or syncope	23 (11.8)
Nocturnal enuresis	15 (7.7)
Behavioural or psychological problems	10 (5.1)
Urinary tract infection (confirmed or suspected)	9 (4.6)
Others	88 (45.1)
Total	195

descriptive accounts of local referral patterns to paediatric specialist clinic could be found in the literature to compare the results of this study.

Referrals from maternal and child health centres

The MCHC services are provided by the Department of Health. Each child receives a physical check-up in the first month of life, and again at 2 years and 5 years of age. A large number of normal children are seen at the MCHCs and, inevitably, a range of nor-mal variation is encountered. A large proportion of the referrals from MCHCs may in fact be normal variations.

A large proportion of infants and children (22.6%) were referred to the paediatric specialist clinic because of problems that were related to head size or shape, anterior fontanelle size, time of closure of the anterior fontanelle, and the presence of any bony prominence on the skull. The size and time of closure of the anterior fontanelle vary greatly: most paediatric textbooks state that the size varies at birth, decreases by

Table 6. Referrals from all sources

Reason for referral	Referrals No. (%)
Growth	
head (size, shape, fontanelle)	167 (8.4)
shortness or decreased rate of growth	67 (3.4)
failure to thrive, poor weight gain, smallness, or thinness	71 (3.6)
tallness	38 (1.9)
obesity or large build	63 (3.2)
Subtotal	406 (20.5)
Respiratory problems	
asthma, cough, or wheeze	313 (15.8)
other respiratory problems	32 (1.6)
Subtotal	345 (17.4)
Heart problems	
heart murmur or known congenital heart disease	180 (9.1)
palpitation or arrhythmia	30 (1.5)
chest pain	22 (1.1)
others	4 (0.2)
Subtotal	236 (11.9)
Neurological problems (including delayed development, convulsion, headache, etc)	151 (7.6)
Renal	
nocturnal enuresis	62 (3.1)
urinary tract infection	55 (2.8)
others	6 (0.3)
Subtotal	123 (6.2)
Neonatal jaundice	111 (5.6)
Endocrine	75 (3.8)
Abdominal pain	56 (2.8)
Others	482 (24.3)
Total	1985

6 months of age, and closes by 12 to 18 months. In a study of 704 Chinese babies from birth to age 24 months,[1] the mean longitudinal and transverse diameters of the anterior fontanelle remained the same in the first 4 months of life and ranged from 9 mm to 42 mm. The diameters became smaller by age 6 months, and the anterior fontanelle was already closed in 5% of babies aged 6 months, but was still patent in 15% and 8% of babies at age 18 months and 24 months, respectively. The doctor performing the screening examination should take note of this wide range of normality. While deviations in size and time of closure of the anterior fontanelle may be a feature in some rare conditions such as hypothyroidism, skeletal abnormalities, hydrocephalus, and cranial synostosis, these conditions are unlikely when head growth is normal and other physical signs are absent. In addition, although head size is usually proportional to body build, the head may be disproportionately big or small without any pathological reason. Serial measurements are thus definitely more useful than single-point measurements. Special medical attention is required for babies with a head circumference that crosses centiles or is at or below three standard deviations from the mean.

Failure to thrive, poor growth, shortness, or smallness were common referral diagnoses (64/689; 9.3%). In general, children were referred to the paediatric clinic for unsatisfactory weight gain if the body weight was close to the third centile. Many of them were normal healthy small-build children with a length/height that was also close to the third centile; one or both parents may also be short. Serial measurements are again essential. Referral to a specialist is recommended if the curve crosses two centiles (or one centile for a young child) or if a single measurement lies at or below three standard deviations.[2] In contrast, some apparently healthy infants were referred for crossing down weight centiles in the early months of life. These were usually infants with a satisfactory birthweight, but who subsequently had a reduced growth rate. Birthweight is dependent on maternal and intrauterine factors, whereas genetic factors determine the growth potential after birth.[2] An awareness of such a phenomenon alleviates parental anxiety and reduces unnecessary investigations.

Heart murmur was a common reason (116/689; 16.8%) for referral, but only one fifth of infants were later found to have structural or functional abnormalities of the heart. Heart murmurs are present in as high as 50% of normal children and most of the murmurs are innocent.[3] Hence, doctors performing the screening examination should concentrate on individuals with symptoms such as cardiopulmonary distress and obvious murmurs. This practice, however, may be difficult for doctors who have had no training in cardiology. The specialist clinic should try to minimise the waiting time for referrals of infants with cardiac problems, because it is very difficult to identify urgent cases from reading the referral letter only. The PYNEH arranges for newborns with heart murmurs to be seen at the cardiac clinic as soon as possible because these infants are the most vulnerable.

Many babies (75/689; 10.9%) were referred to the paediatric clinic because of jaundice that extended beyond the first 2 weeks of life. Breast-milk jaundice is a benign condition, but some diagnostic investigations are usually performed to differentiate it from non-benign conditions. Under the present system, cases of paediatric jaundice that are detected in the MCHC are referred to the hospital accident and emergency department or paediatric specialist clinic for further management. This practice had been adopted for many years, but it is not necessarily the best arrangement: parents usually find it difficult to make multiple visits to the hospital and MCHC. One of the reasons for the referral is that doctors in MCHCs have limited access to facilities to perform laboratory investigations. Despite this limitation, doctors in MCHCs see a large numbers of babies with jaundice. A jaundice meter that measures the degree of yellowness of the skin is frequently used to estimate the degree of jaundice, because readings correlate well with the serum bilirubin level. A blood sample can be taken if the reading is above a certain level, depending on the baby's race and basal skin colour.[4] Studies in Chinese infants have shown that most newborns with serum bilirubin concentrations above 221 mmol/L can be identified by using the jaundice meter, which gives a reading of >20.[5,6] However, it is unreliable to diagnose mild jaundice by using only the jaundice meter reading and the use of the meter for such a purpose has not been recommended. For example, a reading of 15 on the forehead may correspond to a serum bilirubin concentration of as high as 150 μmol/L or as low as being within the normal range.[6] To render good-quality care and parental convenience, cases of breast-milk jaundice should be managed by experienced primary care providers who have access to laboratory investigations.

Referrals from accident and emergency departments

Suspected or confirmed cases of asthma formed a disproportionately large proportion (42.6%) of all cases referred from accident and emergency departments, when compared with other services that provide acute

medical care such as private practitioners (17.2%) and general out-patient clinics (12.3%). It is not surprising that asthma is a common reason for referral, because the prevalence of wheezing or asthma in children is approximately 10%.[10,11] Children who had attended an accident and emergency department for an acute asthmatic attack were referred to the specialist clinic for follow-up. If there were a well-established system of family physicians in Hong Kong, uncomplicated cases could be managed by a family physician.

Referrals from the Student Health Service

The Student Health Service started to provide an annual physical check-up for primary and secondary school students in 1995. Students who are identified by the service as having medical and psychological problems are referred to specialty clinics of regional hospitals for further management. Problems related to growth and pubertal development are, as expected, common reasons for referral.

Obesity has become an important problem in Hong Kong children. In a study performed in 1993, 13.4% of boys and 10.5% of girls aged between 6 and 18 years were found to be obese.[7] The 38 (14.8%) cases that were referred to the specialist clinic in this study were probably only a fraction of all cases identified. At the PYNEH, counselling on a group or individual basis is provided by doctors, dietitians, and physiotherapists to such patients. Parents and children should be educated in the community or at school on how to lead a healthy lifestyle; children should acquire a habit of regular exercise. These measures would be more effective than seeing a doctor after obesity has developed.

Twenty-nine (11.3%) of the 256 children were referred for precocious puberty. Genuine cases of central precocious puberty are quite rare. Most of the referred cases probably represent the early end of the age spectrum for normal sexual maturation. Recent studies performed in Hong Kong have shown that children now have an earlier onset of pubertal development compared with children 20 to 30 years ago.[8,9] At least 10% of Chinese girls had stage II breast development (ie onset of puberty) before the age of 8 years (the third and tenth centiles were 7.10 and 7.95 years, respectively).[8] On the other hand, the third and tenth centiles for stage II of testis development in Chinese boys were 8.4 and 9.3 years, respectively.[9] The usual definition of precocious puberty for Caucasians (ie onset of puberty before 8 years for girls and 9 years for boys) would result in over investigation in approximately 7% of cases. Doctors should therefore consider adopting the new reference standards for local children[8,9] when considering cases of precocious puberty for further investigation.

Conclusion

This study reflects the current referral patterns of various parties and quantifies the major clinical problems encountered at an out-patient paediatric clinic of a regional hospital. Training of physicians from referring parties as well as those in the specialist clinic may be targeted to the common clinical problems identified. The training should include a thorough understanding of the clinical problems, awareness of the normal variations, and knowledge of current reference ranges. Health administrators should focus on major problem areas such as asthma and improve the coordination of the various care providers. Finally, the government and the concerned professional bodies should be aware of their responsibility in promoting a healthy lifestyle to the citizens of Hong Kong, starting from childhood.

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