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## Attention-deficit hyperactivity and developmental coordination disorders: knowledge and practice among child and adolescent psychiatrists and paediatricians

### AIMS AND METHOD

Despite extensive evidence that attention-deficit hyperactivity disorder (ADHD) and developmental coordination disorder commonly present as overlapping disorders, it is not clear whether clinicians routinely enquire about movement difficulties when assessing children with suspected ADHD. We describe a survey that examines knowledge and

practice of child and adolescent psychiatrists ( $n=107$ ) and paediatricians ( $n=51$ ) in this area.

### RESULTS

Results show that 67.3% of child and adolescent psychiatrists compared with 15.7% of paediatricians claimed to have poor or very poor knowledge of developmental coordination disorder, and 28% compared with 5.9% respectively reported that they never

or only occasionally ask about motor difficulties.

### CLINICAL IMPLICATIONS

Child and adolescent psychiatrists should consider routine screening for developmental coordination disorder when assessing for ADHD. Further training in assessment of developmental coordination disorder is recommended to facilitate this.

Greater awareness of attention-deficit hyperactivity disorder (ADHD) among schools, parents and primary care has increased the flow of referrals into specialist child and adolescent mental health services (CAMHS) across the UK. In the UK Office of National Statistics study, a diagnosis of ADHD was shown to be the most common reason for follow-up in specialist CAMHS (Meltzer et al, 2000). This is in line with research from the USA that showed that 30–50% of referrals to CAMHS were specifically related to ADHD (Barkley, 1996).

There is clear evidence of association or comorbidity of ADHD with a number of other psychiatric conditions, including oppositional defiant disorder, conduct disorder, and depression and anxiety disorders (Loeber, 1982; Barkley et al, 1990; Taylor et al, 1991), and these should be routinely considered at the time of assessment.

In addition, it has been shown that approximately half of children with ADHD have developmental coordination disorder (Kadejsö & Gillberg, 1999). Developmental coordination disorder is a term used to describe motor coordination difficulties that have an impact on daily living and education. Children who meet DSM-IV criteria for ADHD (any of the subtypes) and developmental coordination disorder (American Psychiatric

Association, 1994) are sometimes also described as having disorders of attention, motor control and perception or 'DAMP'; this is a Scandinavian construct that attempts to make sense of the comorbidity issues (Gillberg, 2003). Children with disorders of attention, motor control and perception have clinically significant impairment in social or academic functioning, or both, but do not have severe learning disability or cerebral palsy.

There is evidence to support the rationale for asking about motor difficulties in ADHD clinics. For example, Tervo et al (2002) showed that children with ADHD and developmental coordination disorder were more likely to have the severe combined type of ADHD and other neurodevelopmental and behavioural problems than children with ADHD alone. In addition, Hellgren et al (1993) in a long-term follow-up study showed that patients with the combination of ADHD and developmental coordination disorder had a greater risk of long-term psychiatric morbidity than those with developmental coordination disorder alone. Recognising the combination of ADHD and developmental coordination disorder might also be important in terms of responsiveness to different treatment approaches. For example, Blondis (1999) recommends that in order for the needs of children with ADHD



to be addressed, clinicians must be able to recognise motor coordination deficits and give appropriate advice to caregivers.

Despite the evidence, Gillberg & Kadejsö (2003) comment that psychiatrists appear to be unaware of the comorbidity between ADHD and developmental coordination disorder in their young patients and state that specialists need to be able to diagnose motor control problems. To further investigate this assertion we conducted a survey of child and adolescent psychiatrists and paediatricians to examine awareness of comorbidity between ADHD and developmental coordination disorder in theory and clinical practice.

## Method

A questionnaire was devised to determine clinicians' knowledge of developmental coordination disorder and disorders of attention, motor control and perception. Information was sought about whether they could define the terms, whether they asked parents about these conditions or symptoms, and whether they considered that they required further training in this area. Questionnaires were offered to all delegates ( $n=400$ ) at three conferences (in Bristol, London and Edinburgh) sponsored by a pharmaceutical company on topics associated with ADHD (for example prescribing, update on treatments, comorbidities etc.) during a 7-month period between November 2005 and June 2006, with a request that they were completed between lectures and returned to the researchers. Delegates at the conferences included specialist registrars or consultants in child and adolescent psychiatry and paediatrics and other CAMHS professionals. In total, 246 questionnaires were returned, representing a response rate of 61.5% overall.

## Results

For the purposes of this paper, only the responses of the child and adolescent psychiatrists ( $n=107$ , 30 of whom were specialist registrars and 77 consultants) and paediatricians ( $n=51$ , 8 of whom were specialist registrars and 43 consultants) were analysed to compare knowledge and clinical practice between the two professional groups (total  $n=158$ ).

In addition to asking clinicians to rate their knowledge of motor coordination problems in children, whether they would like to receive training in this area, if they asked about or considered such difficulties when assessing children with ADHD, and if so, what symptoms they asked about, the study also collected qualitative data from open responses to the request for definitions of the terms developmental coordination disorder and disorders of attention, motor control and perception. The definitions provided were then analysed for key terms and were coded as either an incorrect response, a close attempt (i.e. one that contained relevant and correct key words but was not exact) or a correct one. The terms coded as correct closely corresponded to DSM-IV criteria where applicable. A further 'don't know' response was collated. The data were interrogated and percentages for the two groups, child and adolescent psychiatrists and paediatricians, were calculated. In order to compare the practice of child psychiatrists and paediatricians, Pearson's  $\chi^2$  analyses were conducted where dependant variables were dichotomous. All statistical tests were considered significant at  $P < 0.05$ .

## Knowledge of motor coordination difficulties

The majority (67.3%) of child and adolescent psychiatrists rated their knowledge of motor coordination difficulties as poor or very poor, compared with a minority (13.7%) of paediatricians ( $\chi^2=37.52$ ,  $P < 0.001$ ). In line with this, 48.6% of child and adolescent psychiatrists compared with 13.7% of paediatricians either did not know what the abbreviation 'DCD' stood for or gave a completely incorrect answer ( $\chi^2=17.98$ ,  $P < 0.001$ ). When asked what the abbreviation 'DAMP' stood for, 59.8% of child and adolescent psychiatrists compared with 27.5% of paediatricians either did not know or gave a completely incorrect answer ( $\chi^2=14.48$ ,  $P < 0.001$ ).

## Clinical practice

Despite their self-confessed poor knowledge base, only 28% of child and adolescent psychiatrists compared with 5.9% of paediatricians admitted to never or only occasionally asking about motor coordination difficulties when

**Table 1.** Areas of motor function enquired about when assessing children with attention-deficit hyperactivity disorder

	Child and adolescent psychiatrists ( $n=107$ )	Paediatricians ( $n=51$ )	$\chi^2$	$P$
Motor coordination difficulties asked about, $n$ (%)				
Clumsiness	103 (96.3)	49 (96.1)	0.000	> 0.05
Self-care (e.g. feeding, cleaning teeth)	64 (59.8)	41 (80.4)	5.67	< 0.02
Dressing skills	76 (71)	46 (90.2)	6.16	< 0.01
Writing ability	86 (80.4)	50 (98)	7.58	< 0.01
Ball skills, team games	85 (79.4)	46 (90.2)	2.11	> 0.05
Scissor skills and other tool usage	44 (41)	37 (72.5)	12.43	< 0.01
Running, jumping, climbing, walking	88 (82)	49 (96.1)	4.60	< 0.05



assessing children for ADHD ( $\chi^2=12.01$ ,  $P<0.002$ ). Table 1 shows the frequency of questioning by child and adolescent psychiatrists and paediatricians in relation to specific aspects of motor function when assessing children for ADHD. Paediatricians were significantly more likely than child psychiatrists to ask about a child's self-care and dressing skills, their writing ability, scissor skills and ability to run, jump, climb etc, but there was no significant difference between the two groups when it came to asking about motor coordination difficulties in very general terms.

### Training needs

There were 92.5% of child and adolescent psychiatrists and 78.4% of paediatricians ( $\chi^2=6.28$ ,  $P<0.05$ ) who said they would like to receive training in motor coordination difficulties.

### Discussion

The knowledge of motor coordination problems among a group of paediatricians and child and adolescent psychiatrists attending three conferences on topics related to ADHD was surveyed. The sample is likely to be biased towards good practice as participants had chosen to attend a conference in this area.

Paediatricians perceive themselves as significantly more knowledgeable about children's motor coordination difficulties and are better able to define terms than child psychiatrists. On enquiring about defining 'DCD' and 'DAMP', there seemed to be some confusion over the terminology, with nearly 50% of child and adolescent psychiatrists not knowing or incorrectly defining the former and nearly 60% the latter.

It was, however, encouraging to find that, despite their lack of knowledge, the majority of child and adolescent psychiatrists were asking routinely when assessing children with ADHD about motor coordination difficulties and activities of daily living, including ball skills and writing difficulties. Such questions were more likely to be in general terms, for example 'is your child clumsy?' (asked by 96.3%), rather than asking about specific detail.

This study highlights the need for greater awareness and training for child and adolescent psychiatrists about motor difficulties. We propose that clinicians would benefit from a greater understanding of basic triage questions relating to a variety of developmental disorders, including developmental coordination disorder, to avoid providing compartmentalised services that do not meet the range of needs that many of these children have. Unless this is achieved there is a risk of children either being passed from service to service or worse, having areas of their difficulties ignored completely. If children with neurodevelopmental disorders do not receive appropriate support there is a consequent risk of

long-term lowered self-esteem and a reduction in academic achievement (Hellgren et al, 1993; Tervo et al, 2002).

An up-to-date review of approaches to assessment and treatment of developmental coordination disorder is provided by Wilson (2005) who recommends a multi-level approach. Unfortunately this is probably outside the scope of most CAMHS at present. More achievable perhaps would be the routine use of parent-completed screening questionnaires for the disorder, for example the Developmental Coordination Disorder Questionnaire (DCDQ; Wilson et al, 2000), in CAMHS assessment clinics for ADHD. This could act as a prompt for clinicians to then consider more detailed assessment where appropriate.

### Declaration of interest

None.

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