CASE STUDY 1
Attention Deficit Hyperactivity Disorder (ADHD) in children and young people
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Georgia is 10 and lives with her mum, Emma, her dad, Nick and her younger brother Sam, aged 7. Emma is a teaching assistant at the local first school and Nick is an accountant. Georgia attends the local junior school and will be moving up to high school within the next year. At a recent parents evening, Emma and Nick were concerned to hear that Georgia has been struggling with her schoolwork and has fallen significantly behind in some subjects. There have also been some difficulties in friendship groups and Georgia is often involved in arguments in the playground. On a positive note, her teacher is pleased to report that she is doing exceptionally well at sport.

Emma and Nick have noticed that Georgia has become more and more disorganized over the past 18 months. She has lost many items of school equipment and is often late leaving the house for school and for social events, as it takes her so long to get ready. Georgia is often restless and finds it difficult to concentrate, even on things that she finds enjoyable; for example, it is unusual for her to be able to sit and watch a film through to its conclusion. Emma remembers that she was a lot like this when she was a child, and has not been particularly worried until now. Both she and Nick are concerned about the fact that Georgia is struggling academically but are more worried about the fact that she appears to be having problems making and keeping friends.

Are Georgia’s experiences unusual for a child of this age?

At the age of 10, a child is developing rapidly – physically, emotionally and intellectually. Physically, the child’s strength and co-ordination in undertaking fine motor tasks are likely to be increasing at a fast pace. Some children of this age will be entering puberty, with all of the associated physical and hormonal changes. If this is the case for Georgia, it could explain some of the difficulties that she is experiencing in her friendships, as she may be irritable or emotionally volatile.

Cognitive and emotional development is also rapid at this time. Georgia is likely to be demonstrating more independent behaviour and may challenge boundaries. She is likely to be gaining a greater awareness of the needs and feelings of others around her, and of the impact of her behaviour. Her ability to problem-solve and plan ahead should become more apparent at this time but this appears to be problematic for her, both in her school work and in her difficulties in organizing herself which might suggest a developmental problem.

Georgia did not have any problems with academic work before this year and although she was not top of the class, she always managed to meet the expected level of work. When Emma and Nick ask Georgia about what is happening at school, Georgia tells her parents that she is finding it difficult to concentrate and that she often misses instructions given by the teacher.
She has become embarrassed by this and is now hesitant about asking for help as she has been told off on a number of occasions for 'not listening'.

Emma decides to consult her GP, who asks to meet Georgia for an assessment. The GP asks Georgia and her parents to complete a Strengths and Difficulties Questionnaire (SDQ; Goodman 1997) and reviews Georgia’s developmental history. The GP also spends time talking to Georgia about how she is feeling and how she views the situation.

The SDQ results suggest that Georgia is significantly distressed by her problems at school and also that Georgia’s parents have noticed a marked impairment in her functioning recently, particularly her organizational abilities. The GP offers to refer Georgia to a paediatrician at the local hospital for a specialist opinion.

**Why would the GP refer Georgia to a paediatrician rather than a mental health service?**

Although Georgia is experiencing emotional distress as a result of her difficulties, there is no evidence of depression or an anxiety disorder (refer to case studies in this volume for further information). Paediatricians undertake a detailed assessment of a child’s development. Poor concentration, poor organizational abilities and restlessness may point to a developmental disorder such as Attention Deficit Hyperactivity Disorder (ADHD). It is important that problems such as hearing disorders, epilepsy or thyroid problems are ruled out as symptoms of these conditions can be mistaken for developmental disorders (National Collaborating Centre for Mental Health (NCCMH) 2009). If the paediatrician is satisfied that no significant physical or developmental problems are present, then a referral to a Child and Adolescent Mental Health Service (CAMHS) could be considered.

Emma, Nick and Georgia are invited to attend an appointment at the paediatric outpatient department at the local hospital.

**How would the paediatrician assess Georgia?**

The paediatrician carried out a detailed developmental history by asking a range of questions about Emma’s pregnancy. This included questions about Georgia’s birth and early development; for example, when she reached significant milestones such as walking, talking and toilet training. Emma explained that Georgia has always been a very ‘busy’ child, but that this had never been a problem for her parents as they are both very active people. Georgia did not sleep particularly well as a baby, and still finds it difficult to settle down when she goes to bed.

The paediatrician notes that Georgia has been having problems at school and that her academic progress has been affected recently. She also observes that Georgia struggles to sit still during the consultation and that Emma has come prepared with books and toys, which are of limited success in keeping Georgia occupied. Emma admits that this is normal for Georgia and that it has always been difficult to retain her attention for more than around 10 minutes at a time.

Emma and Nick are given some rating scales to complete (Conners’ Rating Scales), and are asked to take a separate rating scale into school for Georgia’s class teacher. The paediatrician explains that the scales provide a picture of Georgia’s behaviour at home and at school, and that this information will be helpful to her in considering what to do next. A further appointment with the family is arranged for two weeks time.

**What is the purpose of ADHD rating scales?**

Conners’ Rating Scales (Conners et al. 1997) have been used in the diagnosis of ADHD since their publication in 1997. They are designed for use in research projects and in clinical settings
to identify patterns of behaviour in children and young people, as perceived by their parents and teachers. There is also a self-report form for young people between the ages of 12 and 17 (Conners and Wells 1997). The questionnaires are scored to produce ratings in each of the following areas:

- Oppositional
- Cognitive Problems/Inattention
- Hyperactivity
- ADHD Index

There are also more detailed versions of the questionnaires that can be used where appropriate, for example, if the child or young person presents with symptoms of depression or anxiety in addition to those of ADHD. The questionnaires also help to identify impulsive behaviour that could put the child or young person at risk of harm. A diagnosis of ADHD can increase the risk of substance abuse or involvement in crime (NICE 2008) and a risk assessment is therefore an important part of the review by the paediatrician. For some young people, referral to specialist agencies, such as a youth offending team, may be appropriate.

5 Are rating scales a reliable way to diagnose problems such as ADHD?

Rating scales, also referred to as standardized measures, are used by mental health professionals to assess symptoms of a wide range of conditions including anxiety disorders, depression and ADHD. These scales can be useful in gathering detailed information about the symptoms experienced by patients and/or their families, but it would not be appropriate to rely on them as the sole means of diagnosis. A clinical interview enables the clinician to understand the contexts in which the symptoms occur, and their impact on the patient.

Emma, Nick and Georgia return for the follow-up appointment with the paediatrician. They return the completed Conners’ Rating Scales, and the paediatrician reviews the scores during the appointment. Both sets of results indicate that Georgia has significant problems with inattention. There are no obvious problems with oppositional behaviour, which corresponds with the accounts given by Georgia and her family, and Georgia’s teachers. Hyperactivity scores are low on the teacher’s rating scale, and only slightly raised on the parent report scale.

The paediatrician explains that the assessments suggest that Georgia has Attention Deficit Disorder (ADD). Although hyperactive behaviour is often associated with symptoms of inattention and poor concentration, this is not always the case and for Georgia, hyperactivity is only a minor problem. However, it is clear that her symptoms are causing her significant difficulty at school. The paediatrician therefore suggests that it might be helpful to undertake a trial of medication.

6 What medications would be used in the treatment of ADHD?

In the UK, three drugs are licensed for the treatment of children and young people with ADHD. These are:

- Methylphenidate (marketed as Concerta, Equasym or Medikinet)
- Atomoxetine
- Dexamfetamine
NICE Guidelines (CG72, 2008) suggest that methylphenidate should be considered as the first option for children and young people who do not have co-morbidities.

**How do drug treatments for ADHD work?**

Methylphenidate and dexamfetamine are stimulants that affect the central nervous system (CNS). They are believed to work by altering brain chemistry, in particular the levels of the neurotransmitters dopamine and noradrenaline (NCCMH 2009). Both these substances affect mood, movement and concentration. Atomoxetine is not a stimulant drug, but is thought to enhance levels of noradrenaline in the brain.

The paediatrician explains that a treatment trial would involve starting the drug at a low dose and titrating this over a period of four to six weeks. During this time, Georgia would be closely monitored for side effects, which can include insomnia, headaches, reduced appetite and nervousness. ADHD medications can also affect growth and it is therefore important that height and weight are checked regularly. The drug can be dispensed in a slow-release formulation, so Georgia would not have to take more than two doses per day.

Emma and Nick are concerned about the prospect of Georgia taking medication and they are not keen to consider this as the first option for treatment. Emma is particularly reluctant as she is very keen on natural remedies and has been researching the positive benefits of omega 3 and 6 supplements for children with attention problems. Emma admits that she is sceptical about the diagnosis of ADHD, as she believes that she suffered similar symptoms to Georgia when she was a child and it did not significantly affect her life. She also raises the point that: ‘ADHD has only existed for the last few years. There have always been children with these problems and they didn’t have to take medication!’

**Is there strong evidence that ADHD exists?**

Diagnosis of ADHD depends on the opinions of a range of individuals. There is no objective test for the disorder, and it is not always clear which professional service is the most appropriate to care for an individual affected by ADHD. This is one of the reasons why it is so important for ADHD to be managed by multidisciplinary professional teams (NICE 2008). Although diagnosis is not always straightforward, the effects of symptoms reported by children such as Georgia are clear – whatever name these symptoms are given, they can significantly affect functioning and quality of life.

The paediatrician discusses these issues with Emma and Nick, and listens to their concerns about medication. Nick is interested in the idea that these symptoms might be inherited, and wonders if their son Sam might also be at risk of developing problems.

**Are ADHD symptoms inherited? Is Sam also likely to be affected?**

Research suggests that ADHD symptoms are likely to be genetic (NCCMH 2009). Emma reports similar experiences to those currently affecting Georgia, and it would be reasonable to assume that there is an element of heritability in this case. Although boys are statistically more likely to develop symptoms of ADHD (Ford et al. 2003, cited in NCCMH 2009), it is by no means certain that Sam will develop symptoms. Emma and Nick ask if there are alternatives to medication.

**What other treatments might be helpful for Georgia?**

The paediatrician is keen to know what Georgia thinks about treatment, and asks her what kind of help she would like. Georgia says that she would like to be more organized, and wants
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to know if there are things that she can do that might improve her memory. The paediatrician agrees to refer Georgia to the department’s psychologist for **cognitive behavioural therapy** (CBT), which can be beneficial in the treatment of ADHD, particularly when inattention is the most troublesome symptom (Kendall 2006). She also suggests that Emma and Nick might benefit from meeting other parents in their situation and recommends a support group organized by the local branch of the ADHD charity, ADDISS (http://www.addiss.co.uk/ accessed 7 August 2011).

Emma asks if it is worthwhile trying food supplements or changes to Georgia’s diet. The paediatrician agrees that some parents have noticed significant changes in the behaviour of their children when certain foods are excluded. Research suggests that supplements of essential fatty acids (EFAs) can be beneficial (Hurt et al. 2011) and the paediatrician is happy for Emma to introduce them to Georgia’s diet. She advises Emma to keep a food diary and to monitor her daughter’s symptoms over the coming months. A follow-up appointment is arranged for three months time.

At the follow-up appointment, Georgia reports that she has felt more settled at school recently. She has joined the netball team and has played for her school, which has improved her confidence and introduced her to new friends. Georgia is not sure if her concentration is any better, but her sessions with the psychologist have helped her to become more organized through using a diary and reminders on her mobile phone.

Emma and Nick have attended two meetings at the local ADHD support group, and have had the chance to talk with parents who have chosen to accept medication for their children. As a result of this, they are less opposed to the idea of medication as a result, but tell the paediatrician that they would like to wait and see how Georgia manages the transition to high school before they decide what to do next. They have adjusted Georgia’s diet, as the food diary revealed that foods with artificial colouring seemed to aggravate her symptoms. Georgia continues to take EFA supplements daily, as several parents at the support group have reported good results on this regime.

Emma asks the paediatrician if Georgia will continue to have symptoms of ADHD when she is an adult.

**Does ADHD carry on into adulthood?**

Adults can be diagnosed with ADHD, and those diagnosed in childhood have a strong chance of at least some of their symptoms persisting into their twenties and beyond (NCCMH 2009). NICE (2008) suggest that approximately 2 per cent of the adult population worldwide are affected by ADHD.

Georgia is offered a further review appointment in 12 months time.

**REFERENCES**


Appendix: DSM-IV Criteria for ADHD

I. Either A or B:
   A. Six or more of the following symptoms of inattention have been present for at least 6 months to a point that is disruptive and inappropriate for developmental level:

   **Inattention**
   1. Often does not give close attention to details or makes careless mistakes in schoolwork, work, or other activities.
   2. Often has trouble keeping attention on tasks or play activities.
   3. Often does not seem to listen when spoken to directly.
   4. Often does not follow instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions).
   5. Often has trouble organizing activities.
   6. Often avoids, dislikes, or doesn’t want to do things that take a lot of mental effort for a long period of time (such as schoolwork or homework).
   7. Often loses things needed for tasks and activities (e.g. toys, school assignments, pencils, books, or tools).
   8. Is often easily distracted.
   9. Is often forgetful in daily activities.

   B. Six or more of the following symptoms of hyperactivity-impulsivity have been present for at least 6 months to an extent that is disruptive and inappropriate for developmental level:

   **Hyperactivity**
   1. Often fidgets with hands or feet or squirms in seat.
   2. Often gets up from seat when remaining in seat is expected.
3 Often runs about or climbs when and where it is not appropriate (adolescents or adults may feel very restless).
4 Often has trouble playing or enjoying leisure activities quietly.
5 Is often ‘on the go’ or often acts as if ‘driven by a motor’.
6 Often talks excessively.

**Impulsivity**

1 Often blurts out answers before questions have been finished.
2 Often has trouble waiting one’s turn.
3 Often interrupts or intrudes on others (e.g., butts into conversations or games).

II Some symptoms that cause impairment were present before age 7 years.
III Some impairment from the symptoms is present in two or more settings (e.g., at school/work and at home).
IV There must be clear evidence of significant impairment in social, school, or work functioning.
V The symptoms do not happen only during the course of a Pervasive Developmental Disorder, Schizophrenia, or other Psychotic Disorder. The symptoms are not better accounted for by another mental disorder (e.g. Mood Disorder, Anxiety Disorder, Dissociative Disorder, or a Personality Disorder).

Based on these criteria, three types of ADHD are identified:

1 ADHD, *Combined Type*: if both criteria IA and IB are met for the past 6 months.
2 ADHD, *Predominantly Inattentive Type*: if criterion IA is met but criterion IB is not met for the past six months.
3 ADHD, *Predominantly Hyperactive-Impulsive Type*: if criterion IB is met but criterion IA is not met for the past six months.