Annotation: The use of psychotropic medications in children: a British view

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Background: Prescribing practices relating to the use of psychotropic medication with mentally disordered children have changed significantly in Britain over recent years. Methods: I conducted a review of the modest body of empirical data available relating to the prescribing practices of child psychiatrists, paediatricians and general practitioners (primary care physicians). The data were obtained primarily from postal questionnaire studies but also from British drug studies and a government-sponsored evaluation of the efficacy of stimulant medication. Postgraduate training guidelines for the three principal clinical disciplines are also discussed. Results: Systematic evaluation of prescribing practices has a relatively short history. All the studies reviewed demonstrated consistent methodological weaknesses, the most important of which was reliance upon retrospective reports of prescribing practices from clinicians with no analysis of actual prescription data. No studies relating to the general use of psychotropic medication by paediatricians were found. Child psychiatrists and general practitioners appear to be using a range of drugs for a range of conditions; however, there was evidence of intra- and interdisciplinary variations in practice. It was also evident from the general practitioner data that drug treatments were frequently used for conditions best managed with behavioural methods (e.g., common sleep problems and enuresis). Government prescription data relating to methylphenidate use in ADHD reveal a dramatic rise over the past ten years. Currently, most child psychiatrists use this treatment compared to approximately half the profession only seven years ago. The use of newer antipsychotic agents as well as the SSRI antidepressants appears to be growing in child psychiatric practice. A majority of clinicians surveyed believed that medication was an important treatment modality but also felt that they were relatively unskilled in the field and requested further training. Conclusions: Overall, a picture of both a growing and better informed use of psychotropic medication is emerging in Britain despite shortcomings in postgraduate training. Future research needs to evaluate prescribing practice in a more objective manner in order to improve training and also service developments in the field. Keywords: Paediatric psychopharmacology, prescribing practices, children’s mental health, psychiatric practice.
ethical concerns and funding constraints have been important contributory factors. Criticism of this state of affairs has been a recurrent theme in the paediatric literature (Rylance, 1979; Essex & Rylance, 1997). In a prospective survey of paediatric in-patient prescription practices for drugs conducted in four European countries, Conroy et al. (2000) reported that two-thirds of patients had been prescribed medication that had not received explicit approval for paediatric use by the respective national medicines control agencies. Furthermore, nearly half of all the prescriptions issued over their index period fell into this category. The principal rationale for using most drug treatments with children is through a process of extrapolation from the results of adult studies. This situation applies to the use of psychotropic medication with children and adolescents, with the notable exception of stimulants (currently, methylphenidate and dexamphetamine in the UK). Yet even in the case of stimulants, the data sheet and consensus recommendations respecting their use do not seem to reflect how the agents are actually used in practice, as will be discussed later. Even adult psychiatrists’ prescribing practices often vary from the product recommendations (Lowe-Ponsford & Baldwin, 2000). Thus, there would seem to be discrepancies between both the manufacturers’ recommendations and practice guidelines and actual clinical use of most of these agents. Many commentators, including Wolraich in the companion article (Wolraich, 2002, this issue), point out the potential pitfalls of extrapolating practice with adults to children. Children are not ‘mini-adults’. Both metabolism and neurophysiology change with chronological age and these are factors that might have important pharmacokinetic and pharmacodynamic implications for drug treatment (Taylor, 1994; Boreus, 1983). Furthermore, underlying patho-aetiologial processes may also vary with age: for example, the neurochemical imbalances associated with and, possibly, responsible for major depressive disorder presenting prepubertally may well differ from its post-pubertal form (Goldman-Rakic & Brown, 1982).

General information relating to paediatric psychopharmacology is available in the popular general child psychiatry literature and, to a lesser degree, in paediatric textbooks and academic journals. Currently, North American publications appear to provide more substantial guidance than their British equivalents, although this picture is changing. For example, Kutcher (1997) in his Canadian paediatric psychopharmacology textbook provides comprehensive information on both the theoretical and practical aspects of the subject. Furthermore, the only specialist publication in the field, the *Journal of Child and Adolescent Psychopharmacology*, is American.

It is illustrative of psychopharmacotherapy’s shifting ‘cultural’ position in relation to other therapies in British paediatric mental health practice to compare the space dedicated to the subject in consecutively published textbooks. Thus, in Graham, Turk, and Verhulst’s *Child Psychiatry: A Developmental Approach* (1999) the subject merited only ten out of 600 pages. In the most recent edition of the popular general psychiatric textbook, *The New Oxford Textbook of Psychiatry* (Gelder, Lobez-Ibor, & Andreasen, 2000), the topic merited six out of a total of 244 pages dedicated to child psychiatry. Similar space was apportioned to psychoanalytic practices with children, a form of therapy that most clinicians would regard as representing only a marginal aspect of current psychiatric practice. However, in contrast, the chapter on physical treatments by Heyman and Santosh in the most recent edition of *Child and Adolescent Psychiatry: Modern Approaches* (Rutter & Taylor, 2002) merited the largest text space (along with behavioural therapies) allocated to specific interventions. From this perspective and allowing for the inevitable lag between commissioning and publication, it would seem that the status of psychopharmacology is steadily improving and, as will be discussed, now represents one of the most common types of clinical intervention for children with behavioural and psychiatric problems.

In this annotation British clinicians’ prescribing patterns and practices will be examined by clinical speciality and then by major class of psychiatric disorder with reference to the modest extant literature. Detailed descriptions of the specific applications of the agents discussed and the evidence-base underpinning practice in the field are to be found in Wolraich’s companion article (Wolraich, 2002, this issue) and also in the recent comprehensive review of Riddle, Kastelic, and Frosch (2000).

**Clinical specialities**

**Child psychiatry**

Kutcher (1997) has described the recent cultural shift in clinical psychiatry away from theory-driven to evidence-based and empirically testable clinical practices. He also discussed the major implications this has had, particularly for child and adolescent psychiatry in the developed world. Additionally, there have been unprecedented levels of public pressure to improve clinical services for mentally disordered children and particularly so for those with severe forms of attention deficit/hyperactivity disorder (ADHD). The impact of stimulant therapy for ADHD upon British child psychiatric practice probably represents the single most important recent driver of developments in the field of paediatric psychopharmacology. This has culminated in the first set of national guidelines relating to a specific drug treatment for any discrete child psychiatric disorder: the use of stimulants for attention-deficit deficit/hyperactivity disorder – ADHD (National Institute of Clinical Excellence, 2000). In response to
these pressures, the specialist training of British child psychiatrists now requires that clinicians obtain ‘expert knowledge of the theory and practice of psychotropic drug use in childhood and adolescence’ (Royal College of Psychiatrists, 1998) in order to obtain a Certificate of Completed Specialist Training, a statutory requirement for appointment as a consultant (senior specialist) in the field. Currently, there are no equivalent recommendations relating to any other specific therapeutic modalities. Prior to this development it was entirely possible for trainee child psychiatrists to complete their specialist training with either little or no experience of using any type of psychotropic medication with children or adolescents. Hill (1998) has commented upon British child mental health professionals’ historical neglect of objective research evidence. However, this picture has changed rapidly and most child psychiatrists now recognise that the judicious use of psychotropic medication is an important core clinical skill (McNicholas, 2001). Furthermore, it represents one of the few that they possess that distinguishes them from their fellow multidisciplinary team members (nurses, psychologists, social workers and other therapists).

In terms of changing prescribing patterns, ten years ago a national questionnaire survey (Bramble & Dunkley, 1992) discovered that 89% of 235 child psychiatrists stated that they used psychotropic medication in their practice, albeit infrequently. Similarly, Adams (1991) found that less than half of her cohort of 28 child psychiatrists had employed medication over a three-month index period. James’ (1996) later survey of the prescribing practices of 29 child and adolescent psychiatrists in the Oxford region indicated that the majority of clinicians (N = 24) had employed psychotropic medication over a similar sampling period although, again, infrequently. However, in a follow-up study James and his colleagues (Phillips, Salmon, & James, in press) reported that this figure had increased to 97%. The prescribing of stimulants for ADHD and specific serotonin re-uptake inhibitors (SSRIs) for ‘depression’ represented the largest increase compared to the mid-1990s. McNicholas (2001) found that 98% of her randomly selected cohort of child psychiatrists (N = 107) valued psychotropic medication as an important treatment modality; nevertheless, nearly a third of the respondents stated that they either ‘rarely’ or ‘never’ prescribed. Nearly three-quarters of her sample (71%) believed that they were insufficiently skilled in the use of medication but half of these stated that they would prescribe more frequently if offered better training.

**Paediatrics**

The management of children’s psychiatric disorders can represent a significant proportion of the work-load of the average community-based paediatrician and, increasingly, many hospital paediatricians. Given this, it is surprising that there are no peer-reviewed British prescription studies in this field. Paediatricians are more likely to prescribe when child and adolescent mental health services (CAMHS) are either unavailable locally or, alternatively, their psychiatrists are not prepared to prescribe. At present, very few CAMHS multidisciplinary teams include paediatricians. Thus, children currently presenting to the British National Health Service with psychiatric disorders who might benefit from drug therapy face a treatment lottery. This picture of provision has been demonstrated recently for patients with ADHD within a large British health administrative area, the Trent Region (Keen, Bramble, & Olurin-Lynch, 2000). This study revealed marked disparities in the current ADHD case loads of individual paediatricians, child psychiatrists and clinical psychologists both within and between disciplines. One consequence of this unsatisfactory situation has been the rapid development of the sub-speciality of *developmental-behavioural paediatrics* in Britain. Community paediatric child health services now often provide a parallel, but primarily medically driven, service for many children with mental health problems where psychopharmacological treatment is offered. Furthermore, such services tend to accept mentally disordered children who are intellectually impaired or have an autistic spectrum disorder. Such children are commonly excluded from generic CAMHS despite having well-recognised high co-morbidity for severe mental health problems (Rutter, Tizard, & Whitmore, 1970). As is the case with the training of junior child psychiatrists, the postgraduate syllabuses for paediatricians now include the requirement that trainees develop the requisite skills in psychotropic medication use. However, the specific training guidelines to achieve this end are currently lacking.

**General practice**

Epidemiological research has demonstrated that psychiatric disorders are present in approximately a third of children seen by British general practitioners (GPs), or primary care clinicians, a figure that translates to approximately 10% of all primary care consultations (Bailey, Graham, & Boniface, 1978). Despite this relatively high prevalence, it is extremely unusual for GPs to have received any postgraduate training in the assessment and treatment of common psychiatric disorders (Weeramanthri & Keaney, 2000), let alone training in the use of psychotropic medication. Nevertheless, historically, prescription surveys have revealed relatively high rates of prescription of psychotropic agents by this professional group (Adams, 1991; Bain, 1981; Bailey et al., 1978). Most commonly,
these involved tricyclic antidepressant (particularly imipramine hydrochloride) therapy for nocturnal enuresis and antihistamine sedatives (trimeprazine tartrate, promethazine hydrochloride) for children with sleep schedule disorders. Ironically, both these conditions are best treated by family-based behavioural methods, as will be discussed later. A recent study conducted by Montoliu & Crawford (in press) revealed in a randomly selected cohort of 100 GPs, an annual psychotropic prescription rate of 60%. Again, tricyclic antidepressants represented, by a wide margin, the most commonly prescribed class of drug (for nocturnal enuresis in younger children and ‘depression’ in adolescents). In order of highest citation frequency, the tricyclics were followed respectively by the hypnotics, neuroleptics and SSRIs. These results suggest that despite a decade of practice separating the first and most recent studies, similar patterns of prescribing still obtain. Whilst in the more recent survey most GPs believed that medication when judiciously complemented other forms of treatment, only a fifth of the cohort believed that medication was generally under-used in this context. Significantly, only a quarter felt confident with their knowledge of paediatric psychopharmacology. Indeed, only 4% had received any formal training in child mental health although 60% would have valued more postgraduate training in this field. The Royal College of General Practitioners’ training guidelines (2000) do not refer either explicitly or generally to this area of practice, nor do the postgraduate training or continuing medical education guidelines. Nevertheless, in Britain GPs are the principal referrers to CAMHS and paediatric services and, as such, represent the primary gatekeepers to both secondary and tertiary care. Thus many children, including those with severe and enduring forms of disorder (for example, ADHD, autistic spectrum disorders, and obsessive-compulsive disorder), are not referred for assessment to specialist services because their problems are not recognised (Farmer, Stangl, Burns, Costello, & Angold, 1999). Recent government health planning has emphasised the need for primary care and specialist services to work in partnership in respect of caring for patients with chronic health problems. In the case of children’s mental health, ‘shared care’ arrangements that include inter alia responsibilities for reviewing medication and issuing repeat prescriptions are now being developed for children with ADHD who require psychostimulant medication (National Institute of Clinical Excellence, 2000). It is to be hoped that these will form the model from which other forms of shared drug-based therapies for psychiatrically disordered children will be developed; for example, those receiving long-term treatment with antipsychotic, antidepressant and anticonvulsant drugs.

**Psychiatric and other disorders**

**ADHD and related conditions**

Most British clinicians now accept that ADHD represents a robust clinical syndrome and that it can respond well to stimulant medication (McNicholas, 2001). However, this consensus has been achieved only recently and, as has been discussed, there remains wide variation in service provision for ADHD children within health regions. It would also appear that adult psychiatric services in Britain are currently unprepared to meet the ongoing needs of existing patients after they ‘graduate’ from children’s services (Bramble, 2000). The British preference to reserve drug treatment for the most severe, pervasive and disabling forms of the disorder that correspond more closely to the ICD-10 category of ‘hyperkinetic disorder’ (WHO, 1992) has influenced this position. For example, in the mid-1990s Bramble (1997) found that only half (52%) of a national cohort of 100 senior British child and adolescent psychiatrists were using stimulants in their routine practice. The survey also reported wide variations in terms of all aspects of common prescribing parameters (for example: daily dosages, dose frequency, maximum dose, lowest age of patient treated) and that a small minority of clinicians (approximately one in twenty) did not accept the existence of ADHD as a distinct clinical syndrome. However, it is likely that the majority of clinicians are now prescribing stimulants for their ADHD patients. McNicholas (2001) reported that 99% of her randomly selected cohort of child psychiatrists (N = 107) would prescribe for such cases. As has been discussed, stimulant treatment recently received official sanction by the British government’s National Institute of Clinical Excellence (NICE, 2000). This report also highlighted the fact that there remain an estimated 50,000 children with moderate or severe ADHD (hyperkinetic disorder) who are currently undiagnosed and thus untreated. Department of Health (2000) statistics presented in the figure below reveal a ten-fold increase in the rate of community prescriptions (excluding hospital and private prescriptions) for methylphenidate in England between 1995, when the drug was re-licensed for general use by the Medicines Control Agency (the British equivalent of the American Food and Drugs Administration), and 2000. A similar trend has been reported for the USA between 1985 and 1994 (Pincus et al., 1998). In contrast, it can be observed from the data that the prescription rates for dexamfetamine have tailed off (Figure 1).

Costs of stimulants have also increased exponentially over this period from £40,000 in 1991 to over £4 million for England in 2000 (Department of Health data, 2000). Other agents commonly employed as substitutes for, or to augment the effects of, stimulants in British practice include the tricyclic...
antidepressants, clonidine hydrochloride, carbamazepine and low-dose antipsychotic medication, particularly risperidone. However, only risperidone has been investigated in this context in the UK. For example, Kewley (1999) reported an audit of 30 children, all of whom were co-morbid for both oppositional defiant disorder and conduct disorder, who were treated with low-dose risperidone, usually in conjunction with stimulants. Two-thirds of the patients showed a ‘very significant’ symptomatic improvement and the rates of adverse effects were low. Comparable results were obtained in a survey of parental reports \(N = 170\) of the treatment by risperidone of similarly co-morbid older children and young adults with ADHD (Bramble & Cosgrove, 2002). The mean duration of therapy was 15 months and median risperidone dose was 2.0 mg/day (range: 25 to 7.0; SD: 1.3 mg/day). Parental ratings revealed a mean overall symptomatic improvement of 53% compared to the clinician’s rating mean of 42%. Adverse effects leading to stopping risperidone were low (8%). Severe extrapyramidal effects were reported in only two cases. A quarter of the cohort had committed multiple criminal offences (mean 6.5 per patient) prior to treatment with risperidone. With risperidone therapy, two-thirds stopped reoffending completely.

The most important recent development in the field of drug treatment of ADHD in the UK is the availability of longer-acting preparations of methylphenidate (‘Concerta XL’ and ‘Equasym XL’). These agents provide the practical advantage of a once-a-day dosage regimen for older patients and also potential therapeutic advantages for those where there are major problems of compliance with multiple daily dosage regimens. However, the impact of these new products upon the long-term management of such cases will require close research and clinical audit evaluation. A means of evaluating local practice in respect of the current drug treatment of ADHD has been proposed by Hill and Taylor (2001). This paper provides protocols for auditing use of the stimulants (methylphenidate and dexamfetamine) and also for imipramine hydrochloride, probably the most commonly prescribed second-line agent.

**Psychosis**

Given both the relative rarity and clinical seriousness of psychosis in children and adolescents, there would appear to be tacit agreement among British clinicians that such patients should be managed by experienced psychiatrists. However, the probability is that a community-based child psychiatrist will, on average, encounter approximately one new case a year (Slaveska, Hollis, & Bramble, 1998) so that most clinicians will be relatively inexperienced in this area. Nearly all (99%) of McNicholas’s (2001) cohort stated that medication had an important role in the management of psychoses and a majority (57%) of respondents would prescribe even for ‘mild’ cases. The first-line treatment in these circumstances would be antipsychotic medication. In order to evaluate this practice, Slaveska et al. (1998) reviewed the use of antipsychotic agents by the Trent Regional cohort of senior child psychiatrists over a two-year index period (1995–1997). The results
revealed that three-quarters of the respondents had used this class of agent, half for broadly categorised ‘psychotic’ children and adolescents and a third for patients fulfilling the ICD-10 diagnostic criteria for childhood-onset schizophrenia. James’s contemporary prescription survey (1996) conducted in the Oxford Region reported similar rates of prescription for antipsychotics. Another significant finding from Slaviska et al.’s survey was that nearly a third of the clinicians had employed antipsychotic medication for patients with non-psychotic conditions. In order of frequency, this group comprised: Tourette’s syndrome, behaviourally disordered learning disabled (mentally retarded) children and conduct disorder. Despite the availability at the time of newer, safer and possibly more potent agents (for example: risperidone, clozapine and olanzapine) the most popular agent was thioridazine (thorazine) followed by chlorpromazine, trifluperazine, sulpiride and haloperidol. Taken together, these agents represented 85% of all those used over the index period. None of the Region’s four adolescent in-patient units reported the use of the newer agents. Since then, thioridazine (thorazine) has become available on a restricted basis only and the use of newer antipsychotics (risperidone, olanzapine and clozapine) has increased (Phillips et al., in press). Risperidone, particularly, has become a popular agent in this context and is being used as a first-line drug treatment for both psychotic and also abnormally aggressive children who are co-morbid for ADHD, autistic spectrum disorders or learning disability. The increased use of Risperidone appears to be happening despite its relatively higher cost compared to older agents, such as chlorpromazine and haloperidol, and that that it is currently unlicensed for such use with children in Britain. Its efficacy and relative safety compared to traditional antipsychotics in the context of non-psychotic disorders (other than ADHD) has not been formally assessed.

Depression

The prevalence of depressive disorders rises steeply with age (see the companion article by Wolraich, this issue). North American treatment studies investigating the use of the SSRI, fluoxetine hydrochloride (‘Prozac’), have demonstrated its clinical efficacy in depressed older children and adolescents (Emslie et al., 1997). This contrasts with the lack of predictable degrees of efficacy of traditional tricyclic antidepressants (TCAs), imipramine and amitriptyline in this context (Hazell, O’Connell, Heathcote, Robertson, & Henry, 1995). Fluoxetine is probably the most commonly prescribed antidepressant by child psychiatrists in Britain at present and James’ prescription study (1996) revealed that even six years ago child psychiatrists were using it as frequently as TCAs. Other SSRIs such as paroxetine are also now being prescribed, although there are no con-

Sleep disorders

Research has revealed that despite being common and having high family and behavioural co-morbidity, children’s sleep disorders are under-recognised and poorly treated in Britain (Stores, 1990). There are only nine specialist sleep disorder centres in the UK and only one, in Oxford, for children and adolescents. In the case of the majority of common sleep disorders, the most likely initial form of medical help is a prescription for sedative medication (Adams, 1991). Most medical schools do not provide any undergraduate training in this area (Stores & Crawford, 1998) and there are no explicit higher training requirements in the assessment and treatment of common sleep disorders for child psychiatrists, paediatricians or general practitioners. Repeated night-settling, night-waking and early waking problems are the most common sleep problems in pre-school children and controlled clinical trials have demonstrated consistently that family-based behavioural modification programmes represent the most effective means of treatment (Richman, Douglas, Hunt, Lansdown, & Levere, 1985). In contrast, traditional sedatives (promethazine, trimeprazine and chloral hydrate) afford only temporary relief in these circumstances (Richman, 1985; Simonoff & Stores, 1987) and, at worst, may result in paradoxical reactions in which young children become temporarily uncontrollably hyperactive and confused (Prendergast, 1993). Therefore, medication generally would appear to have a limited role in the management of these common sleep disorders. However, two other agents, the sedative hormone melatonin and stimulant modafinal, have recently been adopted into British paediatric practice. Phillips et al. (in press) discovered that 27% and 12% respectively of their English and Welsh cohorts of child and adolescent psychiatrists had prescribed melatonin over a three-month index period. This is
Despite the fact that it is currently unlicensed for such use in the UK, and can be prescribed only on a ‘named patient’ basis. Furthermore, as yet there is no standardisation of either the therapeutic indications, dosage regimens or the pharmaceutical quality of the various melatonin preparations available at present. Despite its promising potential, particularly in the context of treating severe sleep problems in neurologically compromised children and adolescents (Jan, Freeman, & Fast, 1999), both the efficacy and the clinical uses of melatonin have yet to be firmly established. In comparison, the safety and efficacy of modafinil in the treatment of narcolepsy has been established (Broughton et al., 1997); however, currently it is probably used only on an extremely small scale with children in the UK. This is despite the fact that narcolepsy is not a rare disorder (approximately five cases per 10,000 of the general population). Affected individuals can present initially with psychiatric symptoms and diagnosis of the underlying condition is often delayed for several years (Stores, 1999). Traditionally, narcolepsy is treated with a combination of stimulants and antidepressants (especially methylphenidate and clomipramine); however, modafinil offers the advantage of monotherapy and may also be better tolerated (Broughton et al., 1997). As more clinicians become aware of this condition the use of medication such as modafinil is likely to increase.

Drug treatment for nocturnal enuresis (especially with tricyclics) appears to be a common practice, especially within primary care settings (Montoliu & Crawford, in press), despite the proven efficacy and superiority of non-pharmacological treatments in this common developmental disorder. For temporary symptomatic control, desmopressin is better tolerated and generally safer than tricyclics but considerably more expensive (Friman, 1995). However, no studies have explored the everyday clinical use of desmopressin in the UK.

A range of other types of medication is also employed for other specific sleep disorders and particularly the parasomnias (for example, night terrors, somnambulism, periodic limb movements and central sleep apnoea) but only on a small scale and by those clinicians who have developed a special interest in the field. To date, there have been no studies that have examined prescribing practices in these conditions.

Learning disability (mental retardation) and autistic spectrum disorders (ASDs)

The clinical impact of the mental health needs of children with learning disabilities and autism upon paediatric health services generally and, in particular, for CAMHS and community paediatrics has only recently been appreciated. At present, there is no national strategy for these children. Consequently, provision of local services varies enormously, from, effectively, nothing other than generic clinical services to dedicated multidisciplinary specialist mental health teams that serve a defined geographical catchment area. Through their Child Development Centres, paediatricians are usually the first to diagnose these conditions in younger children and to coordinate the management of their behavioural problems in community and hospital settings, often utilising the skills of local primary care teams. Some child psychiatrists are now developing expertise in the diagnosis and management of the psychiatric manifestations and associations of children with learning disabilities and/or autistic spectrum disorders. However, in McNicholas’s survey (2001), psychopharmacological treatment is only regarded as justifiable in these circumstances by a minority of child psychiatrists: 27% for ‘autism’ and 16% for ‘learning disability’. Services and expertise are also developing for children with autistic spectrum disorders in the normal ability range or when underlying impairments are complicated by significant co-morbidity such as patterns of severe aggression, ADHD, OCD, or seizures. Although the medical treatment of the core impairments of autism remains an elusive goal, co-morbid disorders may well respond to psychopharmacological interventions in combination with non-pharmacological strategies. Traditionally, potent antipsychotic agents such as haloperidol would have been used to treat a range of behavioural problems. Latterly, the recognition that psychostimulants, antidepressants (especially the SSRIs), newer antipsychotics (for example, risperidone) and also traditional and newer psychoactive antiepileptic drugs can be both more effective and also safer in certain circumstances is leading to better practice in respect of this vulnerable group (Prendergast, 2000; Santosh & Baird, 1999).

Anxiety disorders

It is probable that generalised anxiety, panic, phobic and post-traumatic stress disorders are now being treated with psychopharmacological strategies if they prove refractory to psychological management, although the types and prevalence of this type of treatment have not been investigated to date. However, data from a survey by Phillips and her colleagues reveal that the SSRIs (particularly fluoxetine) appear to be becoming the first-line class of drug treatment for clinical ‘anxiety’. In contrast and despite their proven safety and efficacy in the short term, benzodiazepines seem to be used relatively infrequently by child psychiatrists with children (Phillips et al., in press). However, this class of agent may well be a helpful treatment in the treatment of children experiencing disabling acute levels of anticipatory and situational anxiety (Pfefferbaum et al., 1987). The use of novel agents such as buspirone and the newer monoamine oxidase inhibitors (for example, moclobemide) has yet to be
established in the treatment of children with anxiety disorders. Beta blockers (for example, propranolol and atenolol) may be employed to counter the physiological symptoms of arousal in adolescents with performance-specific anxiety or as an alternative to an SSRI in post-traumatic stress disorder. The only British study of the use of serotonergic augmentation with clomipramine for school phobia yielded negative results (Berney et al., 1981).

**Other disorders**

Children with neuropsychiatric disorders that principally present with emotional and behavioural symptoms, such as Tourette Syndrome (TS) and obsessive-compulsive disorder (OCD), may present to any specialist. However, it is likely that both of these serious conditions are often under-recognised or may be confused with features of autistic spectrum disorders. Phillips et al. (in press) have demonstrated that child psychiatrists are employing haloperidol and clonidine for Tic Disorders including Tourette Syndrome, although patterns of use of newer agents (such as sulphiride and risperidone) in this context have not received specific investigation. A range of serotoninergic drugs including fluoxetine and clomipramine have been recommended for childhood OCD (Heyman, 1997). However, only sertraline is currently licensed for use with older children and adolescents in the UK. McNicholas (2001) found that 92% of her cohort of child psychiatrists believed that medication was justified in the management of OCD and Phillips et al. (in press) reported that nearly half of their cohorts of child psychiatrists had prescribed medication for OCD over their study’s three month index period.

**Future directions**

Despite its relatively late start compared to North American practice, paediatric psychopharmacology in the UK is now developing apace in terms of both clinical practice and evaluative research. This picture is broadly comparable to that seen in North American practice (Jensen et al., 1999). Nevertheless, there does appear to be a lag between clinical practice and appropriate training to underpin it. The lack of confidence of the majority of child psychiatrists in this area coupled with a desire of clinicians to receive further training has been reported by several authors (McNicholas, 2001; Slaveska et al., 1998) and for GPs by Montoliu and Crawford (in press). Approved postgraduate training courses in paediatric psychopharmacology are now available to all clinicians. The Royal College of Psychiatrists' (for example: the Child and Adolescent Psychopharmacology Module of the British Association for Psychopharmacology’s Diploma in Psychopharmacology, and the regular meetings of the London-based Paediatric Psychopharmacology Group.)

Research Department ‘Focus’ website (www.rcpsych.ac.uk/cru/focus) has also hosted many discussions in respect of drug therapies, resulting in a publication on the use of stimulants in ADHD (Joughin & Zwi, 1999). These and similar forums provide multidisciplinary networking opportunities that are contributing positively to the development of both drug-based and other therapies within children’s mental health services. It is planned that the Royal College of Psychiatrist’s Faculty of Child and Adolescent Psychiatry will produce an online clinical paediatric psychopharmacology textbook that can be revised and updated quickly with developments in the field.

Other directions for future developments in the field include:

1. **Service developments:** these would include developing treatment protocols across the range of psychopharmacological therapies for specific disorders. Given that the management of severe and enduring mental health problems in children and adolescents is usually extremely resource and labour intensive, it is surprising that the economics of child mental health care have not attracted systematic analysis (Knapp & Henderson, 1999), with the recent exception of the treatment of ADHD (NICE, 2000). There is a pressing need to undertake economic evaluations of comparative treatments for all common disorders in order to rationalise provision of services.

2. **Funding:** In order to sustain the current rapid expansion of drug therapy in the field of child and adolescent mental health, adequate central funding is crucial. Although only representing a fraction of total NHS child mental health expenditure, the sums are not insubstantial. For example, the current annual cost of stimulant medication is several millions of pounds, a figure that is growing year on year (Department of Health, 2002). The increasing use of the relatively more expensive SSRI and newer antipsychotic agents will further add to this.

3. **Training:** The quality and implementation of the psychopharmacology training guidelines already described for paediatrics and child psychiatry need to be independently evaluated and regularly revised. In the case of general practitioners (primary care clinicians), the shortcomings in their post-graduate training need to be acknowledged and addressed quickly and there would appear to be a willingness among practitioners for this to happen. ‘Shared-care’ protocols between primary care clinicians and specialists relating to the drug treatment of the common psychiatric disorders will help to drive these developments.

4. **Future surveys:** There appears to be a pressing need to establish, through standardised national sampling surveys of the principal prescriber groups, the patterns of prescribing of each commonly employed psychoactive agent for particular conditions.
and symptoms. This process could begin with analyses of the data entered by clinicians on the actual prescriptions, such as the age and sex of the patients as well as daily dosages and dosage regimens. To complement this approach, further work should involve clinicians keeping prospective diary records of prescribing activity over fixed periods. Such approaches would remove the major flaw of all of the prescription surveys reviewed, namely their reliance upon clinicians’ retrospective reports, a process that is extremely prone to errors in hindsight and particularly likely to reflect ideal rather than actual practice. Prospective prescribing studies could also provide a means of evaluating the effectiveness of medication in cases with significant co-morbidity, which more accurately reflect everyday practice. Finally, future prescribing studies should attempt to ascertain the attitudes to prescribing held by child psychiatrists, paediatricians and GPs. Through these processes, practice may be better informed and specialist training, service developments and funding strategies adjusted accordingly (McNicholas, 2001).

5. Pharmacological research: Paediatric mental health remains an underdeveloped area of pharmacutical research. British academic departments are well placed to capitalise on this situation and contribute to the clinical development and evaluation of new and existing drug treatments. Child psychiatrists are now collaborating with psychopharmacologists and other applied biological scientists in studies that explore the neurobiological underpinning of drug actions, for example in investigation of the effects of long-term methylphenidate treatment in animal models of ADHD (Sproson, Chantrey, Hollis, Marsden, & Fone, 2001). Essex and Rylance (1997) suggest that the ethical constraints that have previously limited pharmacological research in children previously are overstated and that the slow pace of change in this field represented a process of discrimination against children’s rights. This situation is now changing and currently there is a rapid expansion of systematic academic enquiry in the field.

Conclusions

The emerging picture in Britain is that paediatric psychopharmacology is being increasingly employed as an important component of the clinical management of children and adolescents with severe and enduring forms of mental disorder, often offering the hope of symptomatic relief in conditions hitherto regarded as untreatable. The traditional mainstays of drug treatment, imipramine, thioridazine (thorazine) and methylphenidate, have either now been entirely superseded (thioridazine), more cautiously employed (imipramine) or used more extensively (methylphenidate). Clinical activity in this field is growing quickly and new agents or new applications for existing drugs are being developed across a broad front of clinical need. Paediatric and children’s mental health services are adapting to these changes, but some clinical disciplines are finding this process more difficult than others. In the case of child psychiatry particularly, Gillberg (2000) has recently speculated that the discipline would be unlikely to survive as a distinct medical speciality in the 21st century unless its clinicians accept the proposition that psychopharmacology is an important treatment modality. Recent work has confirmed this is the case (McNicholas, 2001). Yet despite its growing use, there is still no evidence that present levels of provision of this or, indeed, any other specific form of therapy is either generally available or of a comparable quality across the nation. The British government has acknowledged this situation (Secretary of State for Health, 1998). It is to be hoped that its proposals for a National Service Framework for children’s health will directly address these issues and further serve to improve the availability and quality of British paediatric psychopharmacological practice.

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