

## Profiling psychotropic discharge medication from a children's psychiatric ward

**Background:** Psychotropic medication is increasingly used in children to treat psychiatric symptoms or illnesses [1] and behaviours associated with autistic spectrum disorders [2]. Child and adolescent psychiatrists report that stimulants or antipsychotics, namely the atypical antipsychotics, are the medicines they use most frequently in this population [3]. However, the majority of prevalence studies tend to be based upon community or outpatient populations. Information about psychotropic medication use in children's in-patient psychiatric services is largely non-existent. In the UK, there are eight NHS inpatient psychiatric units for children aged 12 years and younger. The units tend to be small (6-10 beds) with an average length of stay of 116 days [4]. Despite the controversial nature of admitting children with mental health issues to in-patient units, they can have a positive impact compared to outpatient interventions, particularly in life threatening situations e.g severe depression, eating disorders [4]. Much of the pharmacological treatment of childhood psychiatric conditions is based upon knowledge and experience of the medication in adult populations. Prescribing governance for psychotropic medication use in children is often limited and much of the medication is used in an unlicensed or 'off label' manner [5]. This includes using licensed medicines for unlicensed indications e.g clonidine for treatment of Attention Deficit Hyperactivity Disorder [ADHD] or using unlicensed doses. By characterising the nature of psychotropic medication used in one children's psychiatric unit, this paper intends to inform prescribing practice within this highly specialised area.

**Objective:** To characterise the nature of psychotropic medication prescribed on discharge from a children's psychiatric unit over a 15 year period.

**Method:** A retrospective analysis of discharge summary letters for all children discharged from a psychiatric unit between Jan 1997 to December 2012. Anonymous demographic and discharge medication details were extracted. Only medication prescribed for treatment of a psychiatric condition, including emotional or behavioural symptoms and treatment of neuro-developmental disorders including tics was included. Medication for seizure control was excluded. Non-psychotropic medicines were included if they were used for psychiatric reasons. Other details' concerning dosages and indication, where available was also extracted. Ethical approval was not required as the study

involved analysis of routinely collected prescribing data and was therefore considered as service evaluation.

## **Results:**

### *Patient population*

234 children [152 males (65%) & 82 females] were admitted over the study period with a mean of 15 admissions per year. The mean age on admission was 9 years, 7 months (range 4 - 14yrs). 117 patients (50%) were prescribed psychotropic medication on discharge, including 24 (n=19 males) who were discharged on more than one psychotropic medicine. Overall, 133 medicines were prescribed at discharge. These consisted of; stimulants (immediate Release n=35, sustained Release n=14), antipsychotics (atypical n=23, typical n= 8), antidepressants (SSRIs n=15, other n=7), other medication used for ADHD (n=11), melatonin (n=10), benzodiazepines (n=7), sodium valproate (n=1) and other medications (hyoscine n=1 and alimemazine n=1).

- Antipsychotics

31 patients (26%) were discharged on an antipsychotic. The majority were male (n= 21, 68%) with a mean age of 11 yrs. Risperidone was most frequently prescribed (n=14) at a mean daily dose of 1mg (range 0.25 – 4 mg, based upon 14 patients). As the number of children discharged on an antipsychotic was relatively small every year; further analysis to find trends/rates in prescribing was not possible.

- Stimulants and other ADHD medication

55 patients (47%) were discharged on a stimulant or another medication used for treating the symptoms of ADHD. 96% (n=53) were male with a mean age of 10 yrs. Some individuals were prescribed combinations of immediate and sustained release methylphenidate (MPH) (n=42); methylphenidate or dexamfetamine augmented with either atomoxetine (n=6) or clonidine (n=6). Further analysis to determine trends in the rate of prescribing was not performed.

- Unlicensed Use

59 patients (50% of all patients discharged on medication, 25% of the total sample) were given an unlicensed medicine or a licensed drug was used in an unlicensed manner. (See Table 1). Risperidone was the most common drug to be used in this manner (n=14). Sleep disturbance and tics were the most common diagnosis to be treated using unlicensed/off label medication (n=10).

### **Discussion:**

Fifty per cent of children discharged from the unit were prescribed a psychotropic medication, of which stimulants were the most popular. This does not mean that all discharges had a definitive diagnosis of ADHD- but rather elements of inattention, hyperactivity or impulsivity were apparent and treated as such. Movement and autistic spectrum disorders were also common amongst this cohort and widely recognised as occurring alongside ADHD. For example, 60-70% of children with ADHD have Tourette's syndrome [6]. This often results in 'ADHD medication' being used in an unlicensed manner e.g atomoxetine for attentional/hyperactivity symptoms in patients on the autistic spectrum or with Tourette's syndrome. Similarly, methylphenidate for ADHD may be used alongside behavioural comorbidities and at higher than licensed doses e.g 72 mg daily. Clonidine, licensed for hypertension is also effective in ADHD with the unlicensed use of clonidine specifically referred to in the NICE ADHD guidelines [7].

Melatonin is a recognised treatment for sleep disorders in children and widely prescribed at discharge. However, there are no licensed preparations in the UK for children. Generally, prescribers use the Circadian® brand but in an off license manner or the Bio-Melatonin brand which has an EU but not a UK license. The majority of unlicensed medication use on this unit occurs with the antipsychotics, particularly risperidone. Most prescribed doses for risperidone were within the licensed dosage range for treatment of persistent /severe aggression in children with conduct disorder. However, its use is unlikely to be restricted to a 'conduct disordered' population. Regardless of the complexities of specific diagnosis and associated symptoms, risperidone is effective against aggression and irritability, which explains its use amongst children with ASD, anxiety and ADHD, all of which exhibit elements of

aggression and irritability, sometimes called 'challenging behaviour'. This is similar to the situation found in the elderly where antipsychotics have been used to address 'behaviours associated with dementia'. The atypical antipsychotics were initially perceived to have a better side effect profile than the older typical antipsychotics. However, complications arising from weight gain, metabolic syndrome and hyper-prolactinaemia caused by the atypicals have curbed initial enthusiasm [8]. In adults, regular monitoring of physical parameters (LFTs, U&Es, fasting plasma glucose, HbA<sub>1c</sub>etc) is recommended and should occur at the start of treatment and at subsequent dosage increases [9]. In children, particularly those with mental health issues, such monitoring poses its own set of difficulties. Children unaware of the implications can be reluctant or totally refuse to permit any type of blood-letting. This often results in treatment being initiated and given without the recommended baseline or subsequent clinical parameters being established. Monitoring if it occurs tends not to be in accordance with recommended guidance (albeit for a different population). Nevertheless, despite the wide range of uses for antipsychotics in children, there is a dearth of information about their clinical effectiveness and long-term safety within this age-group, particularly when co-prescribed with other psychotropic medicines.

It is unfortunate that patient turnover and hence discharges from the unit were relatively modest. This is partly indicative of mental health services in general, where inpatient stays tend to be for a longer period. Additionally, given the added complexity of co-ordinating care with other (children's) services upon discharge, inpatient stays for children can become rather protracted. This partly explains the low average number of discharges (15 per year) seen in this study. The small number of children discharged on antipsychotics each year, made it difficult to analyse the data in a longitudinal manner. However, it is clear that a range of antipsychotics, including the older typical drugs have been in use over the past 15 years. The arrival of the atypical antipsychotics is thought to be a contributing factor to the increased use seen in the community. It is unknown whether this has been a factor in unit prescribing.

Unlike adult services where psychotropic medication is prescribed to many patients at discharge, only half of those discharged from this unit were prescribed psychotropic medication. One reason could be that since the majority of cases had elements of anxiety associated with them, and psychological treatment is the preferred option for these [10], the low number indicates that psychological therapies are being 'prescribed' instead of medication. This would need to be further investigated. Alternatively, perhaps clinicians, wary of the limited knowledge concerning long term use of psychotropic medication on the developing brain, are choosing to time limit the duration that such medication is being taken by their patients.

This study describes the nature of psychotropic medication prescribed on discharge from a specialist inpatient unit and cannot be generalised to patterns of prescribing seen in community paediatric populations receiving psychiatric care.

**Conclusion:** Stimulants and atypical antipsychotics are the most commonly prescribed drugs on discharge from a children's psychiatric ward. Much of the antipsychotic use is for unlicensed indications or at unlicensed doses.

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Table 1. Details of discharge medication when used in an unlicensed manner

<b>Drug Name, licensed indication and max daily dose in children where indicated (as per BNF for Children or SPC)</b>	<b>Off label use in children*</b>	<b>Indication and Dosage n = 59</b>
Clozapine n=1 • Unlicensed in children	• Schizophrenia (adult max 900mg daily)	1 X early onset schizophrenia, 62.5mg bd
Haloperidol (oral) n=2 • Childhood behavioural disorders associated with hyperactivity & aggression (max 3mg daily) • Childhood schizophrenia (max 6mg daily) • Tourette syndrome (max 3mg daily)	• Tics • Tourette syndrome	2 X Tics, 0.5mg & 6mg daily
Risperidone (oral) n=14 • Short term treatment of persistent /severe aggression in conduct disorder or autism >5yrs (max 1mg – 3mg daily)	• Anxiety • Compulsivity/Rigid thinking associated with autism • Tics • Psychosis	5 X Tic disorder, doses range from 0.2mg - 1.0mg daily 9 X Psychosis / delusional/rigid thinking associated with Autistic Spectrum Disorder, doses range from 0.5mg – 1.5mg daily
Quetiapine n=1 • Unlicensed in children	• Psychosis • Schizophrenia (max 750mg daily) • Mania (max 600mg daily)	1 X Unspecified non-organic psychosis , 400mg bd
Sulpiride n=4 • Unlicensed in children	• Psychosis (max 800mg daily) • Tourette syndrome (max 800mg daily)	3 X Psychosis, doses range from 100mg - 300mg daily 1 x Tourette Syndrome, dosage information missing
Atomoxetine n=2 • ADHD (max 120mg daily)	• Impulsivity • Motor hyperactivity associated with autism • Tics	2 X Aspergers syndrome & impulsivity, 25 & 50mg daily
Methylphenidate SR (Concerta) n=2 • ADHD (max dose 54mg)	• Impulsivity • Motor hyperactivity 7 inattention associated with autism	2 X ADHD: 2 X Unlicensed dose of 72mg mane
lisdexamfetamine n=1 • ADHD (max dose 20mg)	• Unknown	Imported from US as Vyvanse- used prior to granting of UK license, 30mg mane
Clonidine n=6 • Severe hypertension (max 1.2mg daily)	• ADHD • Tic disorders (max 0.4 mg daily)	2 X ADHD, 50mcg & 100mcg daily 2 X Tics / Tourette syndrome, 50mcg & 150mcg daily

	<ul style="list-style-type: none"> <li>• Agitation</li> <li>• Aggression</li> <li>• Hyper arousal (max 0.4mg daily)</li> </ul>	2 X Aggression associated with Autistic Spectrum Disorder, 2 X 50mcg bd	
Clomipramine n= 5	<ul style="list-style-type: none"> <li>• Unlicensed in children</li> </ul>	<ul style="list-style-type: none"> <li>• Obsessive Compulsive Disorder (max 3-5mg/kg daily)</li> <li>• Phobia / anxiety states</li> <li>• Depression</li> </ul>	4 X Obsessive Compulsive Disorder, doses range from 20mg – 125 mg daily. Anorexia Nervosa & Depression, 40mg bd
Imipramine n=1	<ul style="list-style-type: none"> <li>• Unlicensed in children</li> </ul>	<ul style="list-style-type: none"> <li>• ADHD</li> </ul>	ADHD, dosage information missing
Lofepramine n=1	<ul style="list-style-type: none"> <li>• Unlicensed in children</li> </ul>	<ul style="list-style-type: none"> <li>• Depression</li> </ul>	Psychotic Depression, 105mg mane
Sertraline n=4	<ul style="list-style-type: none"> <li>• Obsessive Compulsive Disorder (not &lt;6yrs, max 200mg daily)</li> </ul>	<ul style="list-style-type: none"> <li>• Depression</li> <li>• Anxiety</li> <li>• Social phobia</li> </ul>	Depression , 100mg mane 2 X Generalised Anxiety Disorder, 150mg & 100mg mane Separation Anxiety Disorder, 150mg mane
Melatonin n=10	<ul style="list-style-type: none"> <li>• Short-term treatment of primary insomnia &gt; 55 yrs.</li> <li>• Unlicensed in children</li> </ul>	<ul style="list-style-type: none"> <li>• Disordered sleep associated with neurodevelopment disorders including ADHD &amp; Autism</li> </ul>	Doses ranging from 2mg – 15mg nocte
Diazepam n=3	<ul style="list-style-type: none"> <li>• Unlicensed in children</li> </ul>	<ul style="list-style-type: none"> <li>• Anxiety</li> </ul>	Unspecified non –organic psychosis, 5mg tds Catatonia, 2mg PRN Anxiety , 3mg nocte
Lorazepam n=1	<ul style="list-style-type: none"> <li>• Unlicensed in children</li> </ul>	<ul style="list-style-type: none"> <li>• Anxiety</li> <li>• Catatonia</li> </ul>	Anxiety, 1mg tds
Sodium Valproate n=1	<ul style="list-style-type: none"> <li>• Unlicensed for bipolar disorder in children</li> </ul>	<ul style="list-style-type: none"> <li>• Mood Stabiliser</li> </ul>	Bipolar Disorder, 300mg bd

\* children refers to 12 yrs and younger.