Diagnosis, Psychotropic Medication and Outcome in an audit of 150 Child and Adolescent Neuropsychiatric Patients.

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Introduction

This report is a case series seen by a child psychiatrist with a special interest in children and adolescents with Intellectual Disability (ID) and/or ASD. In the absence of evidence-based consensus on diagnostic approaches, the clinician examined psychiatric diagnosis from a clinical descriptive approach, using both dimensional and categorical approaches to diagnosis to inform treatment. There are so few accounts of the reliability of psychiatric diagnosis in children and adolescents with ID (Einfeld *et al*, 2008; Lee *et al*, 2003), and none found in a literature search of cohorts of young people with Autism. In an Australian context, these patients often get poor access to mainstream services, despite severe levels of impairment secondary to their emotional or behavioural disturbance.

A brief history of the diagnosis of mental health problems is as follows. Traditionally, mental health problems were severely under-identified and their emotional and behavioural disturbance was attributed to their ID, thereby denying access to mental health services: what has been called 'diagnostic overshadowing'. Over the last 15 years both the Royal College of Psychiatrists (2001) and American Psychological Association with the National Association for the Dually Diagnosed (Fletcher *et al*, 2007) have brought out guidelines to enable a more consistent approach to people with ID, enabling them **to have the same diagnoses that enable access to mental health services** as people with a normal range of intellect.

A brief comparison of cohort studies between UK and the USA illustrates quite different diagnostic practices, a lack of international agreement in the diagnoses found in people with ID, and possibly different schools of thought underlying these differences. These guidelines also raise areas in which there are difficulties in reliably eliciting psychiatric phenomena, but no guidance on how to resolve these problems (Dossetor, 2011 chapter 20).

In fact it is a regular experience of psychiatrists with special skills and interest in people with an ID, that this 'same access' still means a significant under-recognition of significant mental health problems. This is borne out by the research in the problems that mainstream doctors have in recognising depression and anxiety, ADHD and ASD in this population (Hurley, 2008) and subspecialty research that shows the increased prevalence of these problems in people with ID.

Epidemiological longitudinal studies indicate 40% of children and adolescents have severe and persisting Mental Health Problems (Einfeld and Tonge, 2006) but behavioural questionnaires such as the Developmental Behaviour Checklist (DBC) or the ABC (Aberrant Behaviour Checklist Manual; Aman, & Singh, 1986) don't translate to psychiatric disorders. Further, there has been criticism that different questionnaires don't agree with each other and find different dimensions of disturbance. Further still, the additional impairment of a psychiatric disorder or behaviour disturbance versus that of ID alone has not been quantified in studies.

Disturbed behaviour may be described as due to Mental Illness, Mental Health Disorder, Developmental Disorder, Challenging Behaviour or Behaviour Problem. The labels a clinician uses is substantially a subjective determination affected by profession, employing agency and different theoretical models. Professional practice requires that competing theoretical models be considered and the value of each particular model considered in a particular clinical predicament. After all, both challenging behaviour and mental health disorder are both based on a bio-psycho-social model of poor social adaptation, and more often than not co-occur.

It is in the context of a lack of professional consensus of standards of current practice that an individual clinician's practice can be of interest and illustrate practical approaches to assessment and management and may provide discussion on how to improve diagnostic accuracy.

This is a presentation of a cohort of 150 more or less consecutive neuropsychiatric patients. They represent my practice in mental health and ID and ASD. A few cases that were of a more mainstream population with common psychiatric disorders, such as some of my telepsychiatry clients were not included. I work in a multidisciplinary developmental psychiatry team and work closely with clinicians in the disability services. We promote a developmental framework for

understanding behaviour. This provides a normative framework against which to consider disturbed behaviour and psychiatric diagnosis particularly in the context of abnormal and extreme behaviour or challenging behaviour (Mental Health of Children and Adolescents with Intellectual and Developmental Disabilities: a framework for professional practice, 2011).

However the medical/psychiatric role is to focus on diagnosis and medication management of a particularly disturbed group. We provide tertiary consultations to developmental and behavioural paediatricians and child and adolescent mental health services.

Methods

150 sequential neuropsychiatry files were audited and a database was created. From an examination of the files, the following information was recorded: age, category of ID (mild, moderate, severe, and profound), presence of ASD. The diagnoses as ascribed by the clinician were recorded based on DSMIV diagnostic criteria, but in addition the most common diagnoses were scored in a dimensional on a 0-3 scale of severity. These were: ASD, ADHD, Anxiety, Depression, Aggression and Self Injurious Behaviour (SIB). The other common diagnoses that were noted were Lability of Mood, Developmental Coordination Disorder, Sensory Sensitivity, and Sleep Disorder. The number and type of drugs given before referral and also those trialled but not continued were recorded. The drugs given at last attendance were separately recorded, based on the assumption that they constituted a stable drug regime. The Child Global Assessment Scale (CGAS) (Shaffer et al, 1986) was used to assess the level of impairment at presentation and where possible the score at follow up was also collected. The CGAS records a level of functioning on 1-100 scale, where 70-100 constitutes the normal range for mainstream population, below 50 is considered a severe degree of impairment, and lower levels imply progressively higher levels of dependency.

Results

Descriptive results of the cohort:
Average age was 12.8 years, standard deviation 3.7 years, range 4-23. Sex distribution was M:F 101:49. ID was present in 103/150 (68%). ASD was present in 119/150 (79%). Of those with normal intelligence 37/47 (79%) had ASD.

Average CGAS at presentation was 35 (range 20-55). The average estimated **additional impairment from emotional behavioural disturbance on top of the level of ID was 30** CGAS points. The **average CGAS gain from psychiatric intervention was 20 (range -5 to +30)** on 66 cases on which follow up information was available at the time of audit.
The number of patients receiving medication was 139/150 (92%). The average number of medications per patient was 2.2 (range 0-6).

Table 1: Frequency of Diagnoses

Diagnosis: Common Developmental Psychiatric Disorders	Frequency
ASD	106
ADHD	94
ODD (Aggression)	71
Anxiety	67
Depression	28
Lability of Mood	24
Self-Injurious Behaviour	18
Developmental Coordination Disorder	15
Sensory Sensitivity	9
Sleep Disorder	8
Subtotal	440

Other Diagnoses- Number = 85

Other Psychological Disorders: Recurrent Confusional State, Other Organic Disorder e.g. Catatonia, decline in skills; Pica, Specific Language Disorder, Separation Anxiety, PTSD, Dissociation, Somatoform symptoms, Episodic Dyscontrol, Sexualised Behaviour, Affect Related Voices, Hallucinations, Pseudohallucinations, Rigid/Obsessive +\- Obsessive Personality, Frontal Lobe Syndrome, Foetal Alcohol Spectrum Disorder, Blood Curdling Screaming, Offending Behaviour

Physical Health Problems: Soiling/constipation, Reflux, Eneuresis, Neurological Disorder/Movement Disorder, including progressive decline, Epilepsy, TB meningitis, Traumatic brain injury, Hemicranial Pyrexia, Blind/Deaf, Obesity, weight loss, Immuno-defic, Eosinophilic Oesophagitis, Dental caries

Genetic Disorder or Behavioural Phenotype e.g. VCFS, Kleinfelters, SMS, CHARGE, Sanfilippo, 6-pyruvoyl-tetrahydropterin synthase deficiency, TS, Various Deletions e.g. 2p;

Relevant environmental factors: Child Sex Abuse, Mother-Child Relationship problems, Xs Dependency, Parental Coercion/abuse, Lack of Limits, Domestic Violence.

The table above illustrates the frequency of the common disorders on the top section, most of which can be seen as developmental psychiatric disorders of which 440 diagnoses were made on the 150 patients. The other 85 diagnoses listed were categorised as other psychiatric diagnosis, physical health problems, genetic disorder or behavioural phenotype and disorder of the family environment. The average number of diagnoses per patient was 3.5.

In addition, in 27 cases there was pharmacological treatment of a parent for depression or anxiety disorder. 50 of the cases had other agencies actively involved in managing the cases, as a measure of the tertiary nature of the service. Twenty had disability services involved, of whom 10 had the

tertiary disability service involved (Statewide Behavioural Intervention Service) with whom my team has a service partnership, and 1 was involved with the Disability Criminal Justice Program. Ten had the welfare services (NSW Family and Community Services) of whom 4 were supported by their Intensive Support Service. 9 were in out of home care with a non-government organisation providing specialised accommodation services after parental relinquishment of care. Eleven were seen as part of our telepsychiatry service, which provides a tertiary consultation service to regional NSW CAMHS services. (Most of the telepsychiatry consultations were excluded from this cohort as they were mainstream child and adolescent psychiatry and not part of developmental neuropsychiatry practice.)

With such high frequencies of diagnosis, it was of clinical interest to examine any patterns of presentation. The correlation between the common psychiatric disorders and some other demographic information was examined with simple correlations, to look for patterns of associated comorbidity in this cohort.

Although both associated with maleness, I was surprised that in this cohort ASD and ADHD weren't associated to each other, but they are both associated with lower IQ. The associations listed of lower IQ are consistent with clinical experience: presentation CGAS, ASD, SIB, aggression, ADHD and number of medications used for current management. The correlation of ASD with Anxiety fits my clinical impression but ASD does not correlate with IQ or ADHD. The correlation of ADHD with Depression is an interesting suggestion. Anxiety correlates with depression but also aggression, SIB and DCD. The correlation of aggression with Sensory problems may be an interesting clinical finding as sensory problems are a clinical finding not a recognised psychiatric diagnosis. SIB is associated with the level of impairment, IQ, Depression and Anxiety and the number of current medications possibly because of the pressure to achieve something in this difficult clinical predicament.

Current use of more medications is associated with the level of presentation CGAS impairment, ADHD, Aggression and SIB. Lability of Mood seems to stand on its own as clinical feature which surprised me, because it regularly seems to be clinically relevant to other problems.

A number of referrals to my practice are for assessment of a presumed psychotic illness. In the period of the study there were a few referred as having a psychotic disorder, presumed as schizophrenia and my diagnosis in these cases, supported by treatment effects was major depression, particularly in the context of ASD. There was one ASD boy with anxiety, ODD with an emotionally complex family, including excessive punitiveness, who on turning 18 had a violent episode which led to hospitalisation and a diagnosis of schizophrenia by a new treating team. The reliable diagnosis of schizophrenia in adolescence is often difficult and even more so in the context of ASD (Dossetor, 2007).

Table 3 lists the current medications prescribed on file at the time of the audit. The average number of psychotropic medications per patient is 2.2 with a range of 0-6. Although major tranquillisers are the most frequently used medication, but they are by preference a last choice because they can be seen as a stronger psychotropic with some side-effect cautions, especially if they are needed in the longer term.

I prefer to start with safer drugs like Night Sedation particularly clonidine or melatonin, to see if improving sleep patterns improves behaviour.

Stimulants are the most common psychotropic used in child psychiatry but have often been tried before a patient comes to my clinic. It has a place but has more failures and side-

Correlations Between Diagnoses:

Male Gender correlates with:	ADHD*, ASD*
Lower IQ correlates with:	PreCGAS***, ASD***, SIB***, Agg**, ADHD*, NMeds*
ASD correlates with:	IQ***, Anx***, PreCGAS** (but not ADHD)
ADHD correlates	PreCGAS***, Dep***, Agg**, NMeds**
Anx correlates with:	Dep***, Agg*, SIB*, DCD*,
Agg correlates with:	PreCGAS**, ADHD**, Sensory**, IQ**, Dep*, NMeds**
Dep correlates with:	SIB***, Anx***,
SIB correlate with:	Pre-CGAS***, IQ***, Dep***, Anx*, NMeds**,
N of Meds correlates with:	PreCGAS***, ADHD**, Agg**, SIB**
Pre-CGAS correlates with:	IQ***, SIB***, NMeds***, ADHD***, ASD**, Agg**
Sensory correlates with:	Agg**
DCD correlates with:	Anx*
Labile Mood correlates with:	-
	*=p<.05; **=p<.01; ***=p<.001

Table 2: Correlations between Diagnoses

Medications in Current Use

No. of meds/pt=2.2 (range 0-6)		
Night Sedation:	23pts	Clonidine 16, Melatonin 6, Chloral 4
Stimulants:	38pts	33 Rit, Concerta 7, Dex 2
Anxiolytics:	62pts	Clonidine 56, Propanolol 2, Naltrexone 2, Benzos 2
SSRIS:	48pts	Fluoxetine 35, Fluvox 9, Sertraline 3, Cipramil 1
Other Antidepressants:	47pts	Amitriptyline 39, Clomipramine 2, Strattera 3, Mirtazepine 2, Venlafaxine 1
Mood Stabilisers:	42pts	Carbamazepine 30, Epilim 11, Lithium 1
Major Tranquillisers:	64pts	Risperdal 34, Abilify 18, Seroquel 9, Olanzapine 3 Also trialled but not current: Lithium 4, Buspirone 3, Amisulpiride 1, Chlorpromazine 1, Lorazepam 1
Drugs tried before: Ave=3.4 Range 1-12 (sample of 79)		

Table 3: Medication in Current Use

effects in this population. Anxiolytics: I think one of the reasons for this failure is the frequency of associated anxiety. Four-hourly daytime clonidine (starting dose 25micrograms) is a great anxiolytic especially in those still in earlier development. It is often helpful in anxiety driven self-harm or disruptive behaviour eg in the profoundly disabled. Propanolol has been remarkable in a couple of highly aggressive and self-injurious, agitated non-verbal autistics. Naltrexone is known for its therapeutic role in SIB but is also used in addictive behaviour. I have found it helpful in intense autistic hyperactivity and what I designated self-harming attention hunger. SSRIs have a role for suspected depression, where aggression is driven by stereotypic obsessions and for anxiety. However behavioural activation as a side effect has to be watched for carefully, particularly as the dose is increased.

Other Antidepressants: However, Amitriptyline is a well-established medication which I find very valuable for ADHD in the context of ID and or ASD, where the ADHD is often driving aggression but also with associated anxiety. Noradrenaline antidepressants are better for ADHD and impulsivity which can be a side effect of SSRIs. Strattera, although there is some studies supporting its benefit, I find helpful in exceptional cases, and I find prone to side effects in this population. Mood Stabilisers: Carbamazepine is the mood stabiliser that I was taught to use as a trainee in the mental health of children and adolescents with ID, and Steve Tyrer described it is the universal second line psychiatric treatment which has found an important role in bipolar disorders (along with other mood stabilisers eg Epilim). Major tranquillisers are the most frequent medication but should be kept as a 'treatment of last resort', although they are often started to manage acute disruption in the context of a chronic problem.

Major Tranquiliser: Risperidone has the best evidence of its value in the treatment of aggression of ASD, and it is a tertiary treatment for ADHD, anxiety and the aggression driven by stereotypic autistic thinking. My experience is that olanzapine is most powerful in the management of a recurrent violence for example where it is driven by stereotypic rigid thinking. I use aripiprazole (Abilify) and quetiapine (Seroquel) as second choice major tranquillisers especially where there is problems of weight gain on risperidone. They may be preferred where anxiety is the main driver of disturbed behaviour for example in ASD.

In 1992, I wrote an article entitled 'the hit and miss of magic bullets', describing how medication can be dramatically helpful, but our prediction as to which medication matched the client was poor (Dossetor, 1997). I wish to point out the number of medications of 3.4 per patient that have been tried (not necessarily by me) before the best combination is found. I feel by weighing up the significance of the different co-morbid diagnoses and trying the more established or commonly used treatments first that improves success rate. Different medications may be used to target different components of disorders or symptoms. Although aggressive behaviour is the most common presenting concern, in my view that it is seldom beneficial to make the aggression itself the target symptom for medication. The challenge of the psychiatrist is to identify co-morbid psychiatry disorder the treatment of which improves aggression. Aggression therefore needs to be considered from the context of a challenging behaviour as well as the association of psychiatric disorders, such as those commonly found in this cohort.

Discussion

The most important observation from this study is that the presence of a co-morbid psychiatric disorder is as disabling as or even more disabling than the intellectual disability itself. One of the primary features of diagnosing a psychiatric disorder is the extent to which symptoms or a syndrome are impairing and disabling. In this cohort, on average, both the intellectual disability and the psychiatric disorder each contribute 20-30 points of impairment on the CGAS. However the psychiatric disorder is the reversible component of their disability.

It is a human rights/equity issue that mental health services cannot or do not consider this work core business and this should be a primary concern to disability service providers and funders. We need services with the capacity to provide multidisciplinary assessment and intervention for this group of severely behaviourally impaired children and adolescents with ID, which incorporates psychiatrists with subspecialty skills and interest. It should be the level of behavioural impairment that attracts the multidisciplinary service (Dossetor, 2011 chapter 25) and the assessment should examine the different theoretical models to understand and help the behaviour, rather than having these skills in different agencies, unable to work together collaboratively.

In practice, in NSW, Paediatricians are more likely to be involved, and are helpful for complex medical and developmental co-morbidities. Historically, child and adolescent mental health is provided by behavioural and developmental paediatricians, from whom most of my referrals come. However, there needs to be a more formalised and closer partnership between paediatricians and CAMHS and particularly with psychiatric support for the use of psychotropic medications. The National Roundtable on the Mental Health of People with intellectual disability (Dossetor, 2013) argued for the recognition of subspecialty expertise and the support to enable specialist mental health services for people with intellectual disability, as much of the success of such service provision is dependent on expertise not adequately represented by mainstream mental health services.

In 1993, our department at the Children's Hospital completed an audit on cases for whom medication was needed and given compared to those for which medication was not given and were treated through psychological treatments provided by allied health mental health clinicians. This had similar findings in relation to the CGAS measures used in this study. All children who are prescribed medication receive this within a multimodal intervention approach. However, those that required medication were significantly more impaired than those not receiving medication at the outset, had a greater benefit from treatment, but still remained more impaired at discharge.

Table 4 of CGAS Measures before and after treatment in a department of child psychiatry, comparing patients who received medication vs those that did not, and the average number of points improvement (1993)

Cases	Score before Rx	Score after Rx	Average improvement
Medicated:	39	60	21
Non medicated:	55	65	10

> "the presence of a co-morbid psychiatric disorder is as disabling as or even more disabling than the intellectual disability itself…"

Considering the high prevalence of disorders, this study emphasises the importance of paying attention to anxiety and depression in those unable to describe their symptoms as these easily missed conditions can lead to valuable treatments. Recognising co-occurring anxiety is often the key to successful treatment of ADHD, aggression or SIB. The presence of significant or severe co-morbid anxious arousal has a range of valuable alternative treatments to consider as alternatives to SSRIs which have limited efficacy in this population and problematic side effects such as behavioural activation. A young person with ID who is deteriorating in skills, and may present with a range of bizarre symptoms, is more likely to have depression than psychosis, but it is more difficult to elicit the predominance of mood change.

Other results show that up to 50% of parents have depression, anxiety or burnout which warrants prompt treatment.

The use of more than one medication may be necessary because of the need to treat more than one condition, or because more than one medication may be more effective for a condition. Practitioners regularly focus on targeting a significant symptom with a medication, and sometimes a single medication may have effects on different symptoms or conditions. Hazell (2010) argued for the importance of recognising the role of different drugs in ADHD. He suggested that stimulants were the first line medication for ADHD, clonidine, atomoxetine and amitriptyline were second line medications and mood stabilisers and major tranquillisers were third line treatments. Sometimes intervention is proposed on the basis on a neurotransmitter theory of a problem. One example is the endorphin theory of SIB and stereotypic repetitive behaviour. It is observed that SIB induces endogenous endorphins, giving an 'opiate high' and naltrexone which blockades the effect of opiates can therefore lead to a reduction of SIB.

The common clinical diagnoses that are used in this study, may not be too different from the dimensions of behaviour that are derived from behavioural questionnaires. Accordingly, these epidemiological approaches to maladaptive behaviour in children and adolescent with ID provides some interesting comparisons. The table on page

9 lists the dimensions of the two main behaviour questionnaires, and the related dimensions that are also derived from their questionnaires. The first 3 dimensions (derived by factor analysis) fit with the clinical triad of symptoms associated with ASD. The observation that these factors are more highly correlated to low intelligence than chronological age, provides evidence to support a developmental model for understanding ASD. The same observation can be made of hyperactivity, anxiety and SIB, suggesting there are important developmental processes behind these areas of maladaptive behaviour. The only dimension that correlates with increased IQ is the Disruptive/Antisocial dimension, as active disruption to others requires an awareness of and intent to do harm to another.

Accordingly, these dimensions derived from epidemiological approaches to maladaptive behaviour in children and adolescents with ID support the notion that the common mental health diagnoses used in this study, are validated and probably have strong developmental or skill building components. I have argued that mental health (or losing your mind) will benefit greatly from understanding the processes of development of the mind, as we see in children with ID. This does not however mean that ADHD or ASD as a disorder loses its validity as a psychiatric disorder, even if there is limited research evidence to confirm or deny this.

For less frequent diagnoses such as psychosis or confusional states or frontal lobe syndrome, epidemiological approaches may not be a good way to substantiate these categories. It is in these disorders that psychiatrists may have a better experience, although by no means exclusively.

Conclusion

In diagnosing mental health problems in ID and ASD the main diagnoses are common and co-occur. These mental health problems cause significant additional functional impairment and are likely to be predominantly due to biological factors and associated developmental processes. This study indicates that severely impairing emotional and behavioural disturbance, is the reversible component of their disability and the judicious use of medication is a critically important component of multimodal treatment. It is frequently observed that non-medical treatments cannot engage let alone treat these severely behaviourally impaired patients and medication is often a critical ingredient to gain sufficient improvement that other approaches can be used to enable a skill building approaches to long term recovery of function and participation.

Yet in those with ID and or ASD, medications may have lower rates of treatment success compared with a mainstream population and may have increased risk of side effects. However they are an essential part of treatment of these neurodevelopmental psychiatric disorders, which are central to helping a child or adolescent with mental health problems in ID and or ASD. Yet these disorders are generally not considered to be part of mainstream adult mental health, but are an important part of the practice of adult psychiatrists with a special interest in ID.

The Dimensions of Behaviour Identified from Questionnaires eg Developmental Behaviour Checklist, Aberrant Behaviour Checklist are:

1.	Self absorbed	(x<Low IQ) (stereotypic)
2.	Social relating	(x<Low IQ) (empathy)
3.	Abnormal communication	(x< Low IQ)
4.	Disruptive/Antisocial	(x <High IQ)
5.	Anxiety	(<Low IQ)
6.	Hyperactivity	(?<Low IQ)
7.	SIB	(x< Low IQ)
8.	ASD	(?< Low IQ)
9.	Depression	(?<in Mild/N IQ)

The factors of behaviour questionnaires contribute to validating the main diagnoses & validating a developmental understanding of behaviour

However for less frequent diagnoses epidemiology may be too broad an approach to validate less frequent diagnoses

Accordingly, psychotropic treatment is one component of any multimodal treatment plan that can improve the quality of life of young people with ID. Much of the knowledge of this subspecialty of psychiatry is dependent on expertise, because of the lack of funding to build the evidence base for this stigmatised, disadvantaged and neglected special need population. As my mentor and trainer in child psychiatry for those with an ID, who was a local hero to her patients, used to say 30 years ago: “Any doctor worth his salt needs to be prepared to prescribe”. Based on these clinical descriptions, in the Australian context, paediatricians and child psychiatrists need to collaborate for the sake of these children. Paediatricians should manage the highly prevalent developmental psychiatric disorders and child psychiatrists should provide psychopharmacological support and consult to the lower frequency disorders.

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