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In Review

Treatment of Psychopathology in People With Intellectual and Other Disabilities

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Objective: To review the psychosocial, pharmacological, and other treatments of psychopathology in people with intellectual disabilities (IDs), autism, and other developmental disabilities (DDs).

Method: Systematic reviews and meta-analyses of psychosocial, pharmacological, and other treatments for people with DDs are reviewed.

Results: There is strong evidence for applied behaviour analysis (ABA) and other behavioural treatments of some forms of psychopathology. There is little good evidence to support the effectiveness of cognitive-behavioural therapy, cognitive therapy, sensory interventions, and other forms of psychosocial interventions. Recently, more randomized controlled trials (RCTs) of psychopharmacology have been published, especially with people with autism spectrum disorders. Most RCTs were for externalizing behaviour problems, rather than for psychopathology. These RCTs offer only preliminary support for the effectiveness of pharmacotherapy. No evidence was found for the effectiveness of other biological treatments.

Conclusions: Current research supports the use of ABA and other behavioural interventions for some forms of psychopathology. Evidence for the effectiveness of other interventions is limited or absent.

Objectif : Examiner les traitements psychosociaux, pharmacologiques et autres de la psychopathologie chez des personnes souffrant de déficiences intellectuelles (DI), d'autisme, et d'autres déficiences développementales (DD).

Méthode : Nous avons effectué une revue des revues systématiques et des méta-analyses des traitements psychosociaux, pharmacologiques et autres pour les personnes souffrant de DD.

Résultats : Des données probantes appuient fortement l'analyse du comportement appliquée (ACA) et d'autres traitements comportementaux de certaines formes de psychopathologie. Peu de bonnes données probantes appuient l'efficacité de la thérapie cognitivo-comportementale, de la thérapie cognitive, des interventions sensorielles, et d'autres formes d'interventions psychosociales. Récemment, d'autres essais randomisés contrôlés (ERC) de psychopharmacologie ont été publiés, spécialement avec des personnes souffrant de troubles du spectre de l'autisme. La plupart des ERC portaient sur des problèmes de comportement externalisant plutôt que sur la psychopathologie. Ces ERC n'offrent qu'un appui préliminaire à l'efficacité de la pharmacothérapie. Aucune donnée probante n'a été trouvée sur l'efficacité d'autres traitements biologiques.

Conclusions : La recherche actuelle appuie l'utilisation de l'ACA et d'autres interventions comportementales pour certaines formes de psychopathologie. Les données probantes de l'efficacité d'autres interventions sont limitées ou absentes.

There is robust evidence that behaviour disorders, such as aggression, tantrums, stereotyped movement disorder, SIB, and pica, are common in children and adults with DDs, such as IDs.[1–3] Data on the prevalence of mood, anxiety, and psychotic disorders are less certain because of numerous methodological problems, such as problems in validly diagnosing these disorders in people with DDs, defining and sampling relevant populations, and blurring of point and period prevalence.[4] Although our knowledge of prevalence of psychopathology in people with DDs is uncertain, we can be very certain that psychotropics, including polypharmacy, are commonly prescribed.[5–7] Common risk factors are externalizing behaviour disorders, such as aggression and SIB, rather than psychiatric diagnoses.[8] Additionally, people with DDs are commonly subjected to a wide range of restrictive behaviour management practices in community and institutional settings, such as restraint,[9,10] preventable disability, and increased cost of care.[11] This article will review recent research on psychosocial and pharmacological interventions for psychopathology in people with DDs.

Clinical Implications

- Treatment of psychopathology for people with IDs should emphasize ABA and other behavioural interventions.
- Where service organizations do not have access to these treatments, they should develop competence within their organization to deliver them. If they do deliver nonevidence-based practices, there is a positive burden on the person conducting interventions to clearly and objectively demonstrate that these practices were effective for this person.
- Given the limited evidence to support psychopharmacology and the risks it involves, service organizations should work to reduce its use and substitute more effective and potentially less harmful interventions.

Limitations

- There is a large gap between scientific evidence and service practices, in part because of the lack of good models of how to do so and the lack of professional and other training and technical support to implement evidence-based practice.
- We also lack easy methodologies that routine clinicians can adopt to evaluate the effectiveness of interventions for each person.
- There is a general absence of evidence on the use of psychopharmacology to treat psychopathology in people with IDs.

Psychosocial Interventions

Applied Behaviour Analysis

ABA is a natural science–based approach that aims to change socially significant behaviour based on basic principles of learning, including both respondent and operant conditioning. Behaviour includes both public and private behaviour, such as thinking and feeling. While explaining and changing behaviour, ABA eschews explanatory fictions, such as attributing behaviour change to nonobservable mental states or structures. Although behaviourism acknowledges the importance of biological and cultural evolution in causing behaviour, greater emphasis is placed on operant behaviour and the current environmental variables that control behaviour. These variables include establishing operations, such as reinforcer deprivation and satiation, discriminative stimuli, and contingencies of reinforcement and punishment. Behaviourism includes an account of self-control, in which the person apparently voluntarily emits a controlling response (going for a walk) to change a controlled response (removing negative mood and increasing the probability of positive talk), but ultimately control of such behaviour lies with the environment.[12,13] ABA has characteristic methodologies, including: reliable observation of public behaviour; small *N* designs (that is, experimental designs, such as reversal and multiple baseline designs, rather than group experimental designs); detection of functional associations between independent and dependent variables through visual analysis of graphical representation of individual participants' data without the use of inferential statistic; and evaluation of social rather than statistical significance.[14]

ABA has been highly effective in teaching a wide range of skills and increasing desirable behaviour[15] as well as understanding and reducing many different forms of problem behaviour in various populations.[16,17] ABA has had a particular significance for people with DDs, including early institutional work in the 1960s through to the 1980s, and the development of functional analysis methods after the 1990s.[18,19] This work resulted in a greater focus on nonaversive intervention methods, and an expansion of applications to community settings and natural change agents.[19] ABA has addressed a very wide array of target

Abbreviations

ABA	applied behaviour analysis
AD	antidepressant
ASD	autism spectrum disorder
CBT	cognitive-behavioural therapy
DD	developmental disability
DR	differential reinforcement
EFA	experimental functional analysis
ES	effect size
ID	intellectual disability
NNT	number needed to treat
OCD	obsessive–compulsive disorder
PTSD	posttraumatic stress disorder
RCT	randomized controlled trial
SGA	second-generation antipsychotic
SIB	self-injurious behaviour
SIT	sensory integration therapy
SSRI	selective serotonin reuptake inhibitor

behaviours, including psychopathology in typically developing children and adults[16,17] and early intensive behavioural intervention for ASD.[20]

ABA is based on hundreds of gradually accumulating empirical studies conducted by many independent researchers across the world during the last 60 years.[15] Recent expert panels and authorities, such as the Surgeon General,[21] have identified ABA as an evidence-based practice in diverse areas, such as autism, and as the first-line psychosocial treatment for behavioural and psychiatric disorders in people with IDs.[22,23] Many systematic reviews have also confirmed these conclusions related to the effectiveness of ABA and the general absence of evidence supporting other psychosocial interventions.[24]

Psychiatric Disorders. Several meta-analyses have identified ABA as an evidence-based practice to treat maladaptive behaviour and psychiatric disorders[24,25] in people with mild disabilities.[26] Meta-analyses have also established ABA as an effective or promising treatment for problem behaviour, such as SIB,[27–29] pica,[30] fear, and phobic avoidance.[31]

Jennett and Hagopian[31] conducted a systematic review of treatments of phobic avoidance in people with IDs. None of 3 RCTs met criteria for inclusion. Among 13 small *N* experiments with 28 participants, 12 experiments met inclusion criteria. Interventions were all multi-component behavioural packages that included in vivo exposure and reinforcement. There was no evidence that relaxation alone or CBT were effective in decreasing phobic voidance. The authors concluded that "there is empirical sufficient support to characterize behavioural treatment as a well-established treatment for phobic avoidance displayed by individuals with intellectual disabilities."[31, p 158] These conclusions may be tempered because the studies treated simple but not complex anxiety disorders. A few behavioural studies have also examined treatment for OCD in people with DDs.[32] There are several small *N* experiments that have used behavioural packages[33–35] and DR of low rates of behaviour for OCD.[36,37] Owing to the small number of studies and their variable quality, the authors concluded that behavioural treatment for OCD met Chambless and Hollon's[38] criteria for a possibly efficacious but not an efficacious treatment. Their review also found no controlled studies of psychosocial treatment of PTSD and so failed to find any evidence-based practices for PTSD.

Analogous to mood-induction procedures, several behavioural interventions have shown that it is possible to increase behaviour indicating positive mood and to decrease behaviour indicating negative mood in adults with IDs without depression by scheduling preferred activities associated with positive affective behaviour.[39–41] Two small *N* experiments have taken this approach with adults with DDs and symptoms of mood disorders and clinical depression.[42,43] Other small *N* experiments have successfully implemented packages of behavioural interventions, such as modelling, self-monitoring, and social reinforcement,[44,45] and one nonexperiment has reported the application of contingency management to prevent suicidal behaviour.[46] Finally, one dissertation[47] reported an experimental evaluation of social skills training in adolescents with autism (but not clinical depression), which observed reductions in self-reports of depression and anxiety only in the experimental group. Currently, there is no systematic review or meta-analysis of this literature and thus the status of behavioural interventions for depression for people with DDs is uncertain.

No formal systematic review or meta-analysis of behavioural treatment of psychotic behaviour was identified for this review; however, Travis and Sturmey[48] conducted a review of behavioural interventions for psychotic verbal behaviour in people with DDs and identified 3 small *N* experiments that used nonfunction-based DR, 8 experiments using function-based interventions, and 2 experiments combining behavioural and pharmacological interventions. Subsequently, 1 study demonstrated 4-year maintenance of intervention effects.[49] Thus behavioural interventions may meet criteria for possibly efficacious or efficacious treatments,[38] although no systematic review has yet been conducted.

Other Interventions

CBT is a package of behavioural interventions, including skills training, exposure therapy, self-instruction, and relaxation training, and cognitive interventions, such as retraining maladaptive patterns of thinking. CBT has become increasingly popular as a treatment for anger and depression but has received limited empirical support.[24,25,50] For example, there are no RCTs of CBT for anxiety disorders.[24] McCabe et al[51] conducted an RCT of manualized CBT for depression in adults with IDs and subsequently evaluated dissemination of this program using routine clinicians.[52] Although promising, the RCT was of poor quality: therapists and authors collected self-report and rating data themselves, nonblind, and did not collect data on treatment integrity. One form of CBT that has received more attention is anger management; however, a recent systematic review identified few studies, all of which were of poor quality as they did not demonstrate manipulation of the independent variable and used only subjective outcome measures.[53] Thus there is currently limited evidence supporting the effectiveness of CBT.

Counselling and various forms of psychoanalysis have long been practiced with people with DDs. To date, there are no controlled studies of these forms of interventions.[24]

Sensory interventions, including SIT, and sensory environments, such as Snoezelen, have become very popular and are used to allegedly decrease problem behaviour and increase adaptive behaviour. A meta-analysis of SIT[54] found no evidence for effectiveness in well-controlled studies, and recent evaluations of weighted vests have been uniformly negative.[55] Narrative reviews of Snoezelen have produced mostly negative results, with some hints at

positive outcomes for some clients.[56] These studies lack the rationale that could lead to matching individual differences to Snoezelen, which may result in effective client outcomes; for example, basing Snoezelen interventions on client preferences for materials or the functions of their challenging behaviour may yield more promising results. Thus sensory treatments are currently not evidence-based practices. Auditory integration therapy is another sensory treatment in which the alleged auditory sensitivities of people with ASD are attenuated by playing carefully selected sounds matched to the alleged sensitivities. Several well-conducted studies, with appropriate control groups, have found no effects.[57] Finally, 2 meta-analyses of music therapy with children and adolescents with ASD have reported conflicting results.[58,59] Whipple[58] conducted a meta-analysis of 13 studies comparing music therapy to no music and reported a Cohen *d* ES of 0.77, but this review included 10 unpublished studies. In contrast, a Cochrane review[59] identified only 3 small, short-term studies (total $N = 24$), which found only small effects on communication skills but not when music therapy was compared with placebo. Thus music therapy may have some small, short-term effects. We cannot be confident of this, owing to the small quantity of research in this area and the lack of clinically meaningful outcomes, in terms of both treatment duration and individual social validity data.

Pharmacotherapy

Until recently, there were few RCTs of psychotropics in people with DDs,[60] or RCTs were old and included medications no longer in use or did not include contemporary medications[61]; however, the number of RCTs has increased, resulting in several systematic reviews and meta-analyses. The following section will review the evidence for pharmacotherapy, first for ASDs and then for IDs. Finally, some general observations on evidence for pharmacotherapy will be made.

Autism Spectrum Disorders

To date, Siegel and Beaulieu[62] have conducted the most comprehensive systematic review and synthesis of RCTs of psychotropics with children with ASDs. They updated a previous search in 2010 that identified 33 RCTs published in peer-reviewed journals, with most participants aged 0 to 18 years, and with autistic disorder, pervasive developmental disorder—not otherwise specified, or Asperger syndrome, and which focused on core ASD symptoms, or associated symptoms, such as aggression. The authors reliably rated quality indicators for each study, resulting in rating each study as strong, adequate, or weak. They then rated the level of evidence for the efficacy of each drug as established evidence (meaning at least 2 strong studies or at least 4 adequate studies), as promising evidence (meaning at least 2 adequate studies), and as preliminary evidence (meaning at least 1, for example, adequate study).

Three atypical antipsychotics met criteria for established evidence: aripiprazole for irritability, hyperactivity, and stereotypy; haloperidol for behavioural symptoms; and risperidone for irritability and hyperactivity. There was promising evidence for methylphenidate for hyperactivity and preliminary evidence for risperidone for repetitive behaviour and stereotypy, atomoxetine hydrocloride for hyperactivity, naltrexone for hyperactivity, and pentoxifylline for irritability and social withdrawal. There were 4 RCTs of risperidone with 311 children. Three were of strong quality. One weak-quality RCT showed risperidone was superior to haloperidol by total Aberrant Behavior Checklist score. The primary outcomes were almost all rating scale measures of externalizing behaviour disorders, such as aggression, SIB, and hyperactivity, or ratings of stereotypic behaviour. Few studies reported changes in core symptoms of autism or effects on adaptive behaviour, learning, internalizing behaviour disorders, or psychiatric symptoms. No studies used primary outcomes related to depression, anxiety, psychosis, or other Diagnostic and Statistical Manual of Mental Disorders psychopathology: there were no studies of antipsychotics for psychotic disorders, SSRIs for mood or anxiety disorders, or ADs for depression. A systematic review by Zuddas et al[63] reached similar conclusions based on a smaller sample of 12 RCTs for only 3 medications, and also estimated ESs and NNTs, including an ES of 1.2 and an NNT of 1.5[64] for risperidone, and an ES of 1.2 and an NNT of 3.3[65] for olanzapine, indicating large ESs. They also concluded that open trials conducted after RCTs indicated maintenance after the end of the RCT for up to 12 months, and that relapse occurred after termination of medication.

Clinicians do not treat nonexistent, average people with average outcomes; rather they treat specific people with individual responses to intervention during extended periods of time. A series of small *N* experiments illustrates the importance of these individual differences in response to risperidone. As part of an analysis of a subset of participants in a larger RCT,[66] the authors reported additional experimental analyses of individual participants. Valdovinos et al[67] demonstrated that risperidone reduced SIB and aggression for each of 2 participants in both naturalistic observations and during EFAs; thus, in this study, these individual results reflected changes in group averages. Crosland et al[68] also reported differential effects of risperidone across functions within an individual and across 2 different people. For instance, risperidone suppressed Sean's SIB to a greater extent than his destructive behaviour and his aggression. Risperidone also had idiosyncratic effects during EFAs; for example, it failed to suppress destructive behaviour during the tangible condition for Reggie and during the attention condition for Sean. There were also data on compliance showing that risperidone increased Reggie's compliance, but had little effect on Sean's compliance. Further, Yoo et al[69] demonstrated that risperidone resulted in fewer, and less accurate, responses during a matching task when reinforcement was unavailable, but reinforcement mitigated this outcome. These 3 studies demonstrate that risperidone has idiosyncratic effects, both across and within

individuals, and that the effects of risperidone interact with programmatic variables, such as the use of reinforcement.

There is substantial and robust evidence from RCTs and longer-term, open-ended trials of the negative side effects and safety concerns with SGAs with children, including children with ASD. De Hert et al[70] recently conducted a meta-analysis of 31 studies with 3595 participants, including 4 papers on children and adolescents on the negative side effects of SGAs. Negative side effects included weight gain; adverse metabolic side effects, involving risk of diabetes; changes in thyroid function; and hyperprolactinaemia, with risks of changes in sexual functioning, such as hypogonadism and breast glandular growth. These negative side effects require additional monitoring and further interventions, such as additional psychosocial and drug interventions to attenuate weight gain. Negative side effect profiles varied substantially between each individual medication. For example, De Hert et al[70] concluded that weight gain ranged from –0.2 kg (ziprazidone) to 4.3 kg (olanzipine.) Such data are incomplete as future long-term studies may reveal other negative side effects that short-term RCTs do not reveal and that are currently unknown. Systematic reviews by Deb's group (see Sohanpal et al,[71] Deb et al,[72] Deb and Unwin,[73] Deb et al,[74] and Unwin and Deb[75]) on IDs made broadly similar conclusions (see below).

There have been an increasing number of RCTs of pharmacotherapy for people with ADS of increasing quality during the last 20 years,[68] leading several independent systematic reviews to conclude that risperidone, and perhaps 1 or 2 other psychotropics, meets criteria for evidence-based practice for externalizing behaviour problems; however, these conclusions are compromised in many ways and the clinical utility of these observations is limited. The most telling limitations to these studies is that it is uncertain if they are in fact double-blind[76] as the highly characteristic and visible side effects of risperidone probably makes identification of participants taking the medication very easy. Further, the range of dependent variables is narrow, with almost all studies measuring only externalizing maladaptive behaviour, rather than psychiatric symptoms and other key outcomes, such as adaptive behaviour and learning. Finally, there are few studies that have directly and appropriately compared psychotropics with psychosocial interventions. For example, although an RCT by Aman et al[77] demonstrated that combining risperidone with training from parents produced better child outcomes than risperidone alone, the trial did not include a group that only received parent training.

Intellectual Disabilities

As part of a large systematic review of psychotropics and behaviour problems in children and adults with ID, Deb and colleagues [71–75] conducted a series of systematic reviews of each major class of medication using methods modelled after National Institute of Clinical Excellence guidelines. For example, Unwin and Deb[75] identified 6 RCTs of risperidone, compared with placebo, but no evaluations of other atypical antipsychotics with this population. In their review of all antipsychotics with adults with ID, Deb et al[74] identified only one RCT comparing risperidone with placebo in adults with ID, and conduct and antisocial personality disorders,[78] and one crossover RCT comparing risperidone and placebo, which included both adults and children. Their review of ADs found only one small-scale, crossover RCT of clomipramine for reducing stereotypy, SIB, and repetitive compulsive behaviour,[79] but no RCTs of SSRIs in this population. Their review of mood stabilizers[74] identified only one RCT of lithium.[80]

This series of systematic reviews[71–75] of psychotropics for people with ID are probably the best available at this time; they are notable for their explicit reporting of methodology and careful reporting of what information is currently available on side effects, but reflect the limited quantity of information currently available and the often poor quality of the RCTs. Two limitations of this project were that Deb's group did not conduct meta-analyses and report ESs, NNTs, and numbers needed to harm, and the reviews are now dated and may not reflect developments during the last 5 years.

Conclusions

The strongest evidence for effectiveness of psychotropics comes from multiple RCTs showing reductions in externalizing behaviour. These findings remain controversial because of failures to replicate, at least one study that showed that risperidone and haloperidol were significantly inferior ($P = 0.06$) and cost more than placebo,[81] doubts over the blinding in risperidone studies,[76] narrow range of interventions, and lack of long-term follow-up data. Reductions in externalizing behaviour or psychiatric symptoms alone are insufficient to evaluate the effectiveness of psychotropics; the economics of treatment and overall impact on a person's life are also essential in considering decisions to treat. Romeo et al[81] conducted cost-effectiveness evaluation of an RCT of risperidone, haloperidol, and placebo for aggression in adults and found that aggression was highest with risperidone and lowest with haloperidol (Haldol), but quality of life was worse for people on haloperidol than for those on risperidone. The cost-effectiveness evaluation indicated that there was very little advantage in either medication, compared with placebo, in terms of participant outcome, and that an antipsychotic was not a cost-effective treatment for aggression, unless society put a very high value on modest changes in behaviour.

Several outstanding issues deserve further comment. First, it is remarkable how few RCTs of psychotropics for common psychiatric disorders, such as depression, anxiety, and schizophrenia, in people with DDs have been published. For example, the systematic reviews of Deb's group[71–75] occasionally allude to this issue, but did not report any data that directly addressed it. This may reflect the problems of making psychiatric diagnoses that are sufficiently reliable for drug trials; however, at least 1 study[82] showed that psychiatrists with experience with ID diagnosed depression

during the last 2 years and presence of hallucination and delusions during the last 12 months in people with mild and moderate IDs, with kappas of about 0.7, but with kappas dropping to about 0.5 for psychosis in people with moderate IDs. Second, interactions of pharmacotherapy and environment are likely, including changes in both the effectiveness of stimuli as reinforcers and behavioural function[67–69] but have received little attention, perhaps because of the methodological subtleties and the cost of clearly demonstrating them.[7,83] Third, few pharmacological studies have evaluated the social validity of behavioural changes.[84] Thus, although studies of pharmacological interventions have increased in quantity and quality during the last 10 years, many important questions, both for researchers and practitioners, remain unanswered.

Implications for Practice and Future Research

There is now an accumulation of systematic reviews and meta-analyses that have identified the status of evidence for treatment of psychopathology in people with DDs, such as IDs. There is very strong and highly replicable evidence that CBs can be effectively treated using ABA.[21–31] The ESs are greatest when interventions are based on functional assessments and analyses.[24–26] There is also robust evidence for the effectiveness of ABA for specific problems, such as phobic disorders,[31] SIB,[27–29] and pica,[30] and for certain intervention procedures, such as choice making,[85,86] functional communication training,[87] activity schedules,[88] video modelling and video self-monitoring,[89] positive behaviour support,[90] and caregiver training.[91,92] When reviewing the evidence for the effectiveness of ABA for specific psychiatric disorders, there is robust evidence for the effectiveness of behavioural packages that include exposure and reinforcement[31] and weaker evidence for its effectiveness in depression and psychosis. A major weakness in this literature is that there have been few demonstrations of dissemination in routine services, although see Hassiotis et al[93,94] for a notable exception. This may reflect the absence of published treatment manuals and other training materials and evidence-based models for dissemination. There is much weaker evidence, an absence of evidence, or evidence that some forms of psychological interventions are ineffective. For example, there is a small accumulating evidence base for CBT and DDs in which evidence is strongest for anger management, but absent for phobias and psychotic and other disorders; however, there is no well-controlled evidence for the effectiveness of counselling or for psychodynamic and psychoanalytic psychotherapy, and an absence of evidence for the effectiveness of sensory treatments, such as SIT.

Evidence for the effectiveness of psychotropics is strongest for risperidone, but the evidence for its effects is relatively limited. Most of the evidence is for its effects on externalizing behaviour problems, rather than core symptoms of ASD, skills acquisition, other psychiatric symptoms, or socially valid improvements in lifestyle. The evidence base for psychotropics for people with DDs is growing, but the quality of the studies is often limited. Many questions remain relating to typical clinical practice, such as polypharmacy, rational clinical decision making, and economics of treatment.

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