A critical Examination of the Effectiveness of Pharmacological Intervention for Challenging Behaviour in Individuals with Intellectual Disabilities.

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Abstract
Challenging behaviour can frequently have a detrimental effect on the quality of life of persons with intellectual disabilities and those around them. Given the often recurrent nature of challenging behaviours, it is necessary to employ management strategies to reduce negative effects. One common intervention strategy is the use pharmacological agents to minimize the behaviour’s impact, often in the absence of mental illness. This paper considers the effectiveness of three psychoactive medications (antipsychotics, anticonvulsants and antidepressants) that are commonly used to manage challenging behaviour. It is apparent that the extent to which such interventions can ameliorate challenging behaviour is questionable.

Introduction to Challenging Behaviour

Challenging behaviour has been defined as “culturally abnormal behaviour(s) of such an intensity, frequency or duration that the physical safety of the person or others is likely to be placed in serious jeopardy, or behaviour which is likely to seriously limit use of, or result in the person being denied access to, ordinary community facilities” (Emerson, 1995; as cited by Emerson, 2001). Challenging behaviour includes for example verbal and physical aggression, disruptive and antisocial behaviour, screaming and temper tantrums, self-injurious behaviour, and property damage and destructiveness (Heyvaert et al., 2010).

The development of challenging behaviour can be influenced by the presence of mental illness (Grey, Pollard, McClean, MacAuley & Hastings, 2010) and by the dynamic relationship between
person- and environment-oriented factors, including skill level with regard to language and problem solving (van Nieuwenhuijzen, de Castro, Wijnroks, Vermeer, & Matthys, 2009), adaptive and social abilities (Kearney & Healy, 2011), coping skills and exposure to stress (Janssen, Schuengel, & Stolk, 2002). Challenging behaviours are especially prevalent in individuals with intellectual disabilities, and disability severity is a strong predictor of challenging behaviour presence, including those without comorbid mental illness (Heyvaert, et al., 2010).

Challenging behaviours can have a detrimental effect on the person with the intellectual disability, their family, and involved services, becoming a continuous and sometimes dangerous battle due to the recurrent and occasionally violent nature of the behaviour (Heyvaert et al., 2010; Mills & Rose, 2011). Challenging behaviours may lead to a reduction in quality of life, impede social integration, and become a gross expense to the individual and society with regard to staffing and residential care when necessary (Emerson, 2001).

Managing challenging behaviour

Given the consequences of challenging behaviour for the individual and those around them it is necessary to employ effective strategies to help reduce, control, or eradicate the behaviour. International guidelines recommend that the underlying cause of the challenging behaviour should be identified and addressed as the main goal of behavioural management. When it is not possible to find a cause, the management strategy should aim to minimise the impact of the behaviour on the person, other people and the environment around the individual (Deb et al., 2009). Such management strategies range from biological to contextual interventions, with varying degrees of and evidence for efficacy.

It has been observed that people with intellectual disabilities are regularly prescribed psychotropic medication as a form of intervention for challenging behaviour, often in the absence of psychiatric symptoms (Antonacci, Manuel & Davis, 2008). This has been a cause for concern for over twenty years amidst claims that people with intellectual disabilities are one of the most medicated groups in society (McGillivray & McCabe, 2004). It has also been suggested that medication is often prescribed due to limited resources and an inability to meaningfully change the surrounding environment, in response to calls from nursing and care staff as an immediate solution, and as an alternative to adequate numbers of trained staff (Marshall, 2004).

Despite widespread use of such pharmacological interventions for challenging behaviours there is little empirical evidence on their effectiveness (Grey & Hastings, 2005). Ideally, appropriate empirical
evidence would meet Sprague and Werry's (1971) set of methodological criteria for scientific confidence in pharmacological investigation: placebo control, random assignment of subjects, the use of double blind subjects, standardised dosages, standardised evaluations, and appropriate statistical analyses. Further, McGrath (2010) considers effectiveness, with reference to pharmacotherapy, as whether it works in the real world or not. Work can be described as the ability of the intervention to bring about desired changes without excessive costs. Thus, pharmacological interventions may be considered effective when they reduce challenging behaviours with limited adverse side effects, ultimately making a positive contribution to person quality of life. This evidence ought to come from methodologically sound investigations.

While a wide range of pharmacological agents have been prescribed to people with intellectual disabilities, antipsychotic medications appear to be used most often in the United States, the United Kingdom and Australia as an intervention for problem behaviour (McGillivray & McCabe, 2004). Other types of medication used as interventions include anticonvulsants, antidepressants, and mood stabilizers (Antonacci et al., 2008; Deb, 2006).

**Antipsychotics as interventions for challenging behaviour**

It has been claimed that antipsychotics are perhaps the most common medication used for suppressing the challenging behaviour of people with severe disabilities (McGillivray & McCabe, 2004), yet their use and apparent effectiveness have been reported to be by chance, rather than clear neurological explanation (Kennedy & Meyer, 1998). Antipsychotics can elicit variable treatment responses and effects between individuals. Kennedy & Meyer (1998) point to the potential artifactual effects of antipsychotic medication. They suggest a theoretical basis for the variation in effectiveness of antipsychotic medication on challenging behaviour, noting that operant conditioning may play an adjacent role. With reference to Heyman and Monaghan (1987) it was observed that antipsychotics can have a differential effect based on the density of reinforcement; the suppressive effects of these drugs are inversely related to the density of reinforcement, indicating that the less dense a schedule, the greater the rate reduction of challenging behaviour (Kennedy & Meyer, 1998).

It is further reported that both typical and atypical antipsychotic medications are used for the management of challenging behaviour in individuals with learning disabilities, with differing degrees of effectiveness and adverse effects (Deb, 2006). Typical antipsychotics used to manage challenging behaviours in individuals with intellectual disabilities include chlorpro-
mazine, haloperidol and thioridazine. Slight improvement in rates of stereotypy behaviours in individuals with intellectual disabilities have been observed with the use of haloperidol (Aman, Teehan, White, Turbott, & Vaithianathan, 1989). This study employed a double blind placebo cross-over design. Participants could also be described as diverse, ranging in age between 13 and 35 with intellectual disabilities ranging from moderate to profound. Improvements were also observed in stereotypy behaviours following intervention with thioridazine (Aman & White, 1988) using a double-blind, placebo controlled design. However, Matson and Neal’s (2009) review highlights an overall absence of methodological rigour with regard to the use of typical antipsychotic agents against challenging behaviours in the literature, particularly with consideration to random assignment of subjects, standardised dosages, and standardised evaluations.

These first generation antipsychotics may elicit adverse effects including Parkinsonian symptoms, akathisia and dystonia, and occasionally neuroleptic malignant syndrome and tardive dyskinesia (Deb, 2006). With such serious side effects as these, it is suggested that even if some reduction in challenging behaviour occurs with medication, the drugs do not work, given that the cost exceed the proposed but unreliable benefits, little affecting person quality of life.

As a result of both these methodological queries and prevalent side effects, many practitioners have turned to second generation or atypical antipsychotic drugs in an attempt to control challenging behaviour while limiting adverse extrapyramidal effects (Matson & Mahon, 2010; Ahmed et al., 2000). Atypical antipsychotic medications used to combat challenging behaviour include olanzapine, risperidone, quetiapine, and amisulpiride (Tin, Devapriam, Raju, & Bhaumik, 2008). There have been a small number of randomized control trials which demonstrate some effectiveness of these second generation antipsychotics on challenging behaviours (Ryes et al., 2006; Zarcone et al., 2001).

The strongest evidence to support the use of atypical antipsychotic agents for challenging behaviour comes from risperidone. It has been observed that risperidone is effective and well tolerated in both adult and child populations with intellectual disabilities in managing challenging behaviour (Gagiano, Read, Thorpe, Eerdemans, & Van Hove, 2005; Grey & Hastings, 2005). It has also been noted that challenging behaviour, particularly aggression and agitation can be suppressed relatively quickly by risperidone within a child cohort (Deb et al., 2007; Grey and Hastings, 2005). This may explain why Tin and colleagues (2008) observed that risperidone was more frequently prescribed in the management of behaviour problems in moderate to severe/profound intellectual
disability groups than any other atypical antipsychotic. However, as with typical antipsychotics, non-traditional antipsychotics induce adverse events; primarily somnolence and weight gain (Unwin & Deb, 2011) along with higher risk of cerebrovascular accidents (Tin et al., 2008).

Despite some evidence to suggest that antipsychotics may help suppress challenging behaviour in individuals with intellectual difficulties, caution must be taken given the shortage of randomized control trials, particularly in adult populations. In two systematic reviews, no trial-based evidence of the effectiveness or ineffectiveness, helpfulness or harmfulness of antipsychotic medication for adults with ID and challenging behaviour was found (Brylewski & Duggan, 1999; Brylewski & Duggan, 2004). Additionally, significant proportion of studies exploring the effectiveness of antipsychotics to date have had significant methodological shortcomings; small sample sizes, poorly defined target behaviours, inappropriate and unvalidated outcome measures, along with a widely variable initial selection criterion (Antonacci et al., 2008). One review by Singh, Matson, Cooper, Dixon, and Sturmey (2005) identified just six studies out of 47 that met the methodological criteria for sound psychopharmacological investigation.

It is noted that high medication levels may induce rate reductions as a result of general sedation rather than response-specific effects (Kennedy & Meyer, 1998). There has been little examination of the effect that somnolence may have on the reduction of challenging behaviour (Grey & Hastings, 2005); does the medication reduce challenging behaviour, or is it that the drowsiness and sedation induced by the agent that inadvertently causes a reduction? This issue must be further explored before it can be accepted that antipsychotics as interventions for challenging behaviour work. Further, Ahmed and colleagues (2000) demonstrated that in a notable proportion of intellectually disabled individuals exhibiting challenging behaviour, antipsychotic medication can be reduced or even withdrawn without significant deterioration of behaviour, indicating that the prolonged prescription of antipsychotics may not be necessary.

Tyrer and colleagues (2008) provide key evidence to support the notion that neither old nor new generation of antipsychotics work to reduce challenging behaviour in individuals with intellectual disabilities. In a randomised control trial using both typical and atypical antipsychotics, and a placebo treatment group, it was not only found that there was little difference in treatment effects between typical and atypical antipsychotic medication, but also that the placebo group showed slightly greater improvements than the drug cohorts. The findings illustrate that aggressive challenging behaviour in peo-
ple with intellectual disability decreases whether or not active medication is given. The authors recommended that routine prescription of even low doses of antipsychotic drugs early in the management of aggressive challenging behaviour should no longer be regarded as a satisfactory form of care (Tyrer et al., 2008).

Considering the above research as a whole it may be plausible to suggest that although risperidone may elicit some improvements of challenging behaviour within the first few weeks in children, there is little controlled evidence to support their effectiveness in adults. In addition, antipsychotic medication can induce severe side effects, and given Tyrer and colleagues (2008) finding that patients receiving placebo instead of medication show greater improvements in behaviour, the use of antipsychotics in the absence of psychiatric illness should be spared; although decisions should be made on a case specific basis.

**Anticonvulsants as interventions for challenging behaviour**

Listed by the Expert Consensus Guidelines for Treatment of Psychiatric and Behavioral Problems in Individuals with Mental Retardation (2004) as a preferred medication for the treatment of aggression and self-injury, challenging behaviours, anticonvulsant drugs are the second most common psychotropic medication class prescribed to treat behavioural problems in individuals with intellectual disabilities (Antonacci et al, 2008). However, although some studies have demonstrated a reduction of challenging behaviour, not induced by sedative effects, the behaviour change can only occur with high levels of drug administration (Kennedy & Meyer, 1998).

Given the high levels of medication required to induce change, it is little surprise that side effects are common. In some cases Carbamazepine, Vigabatrin, and Topiramate may exacerbate behavioural problems as opposed to improving them (Santosh & Baird, 1999). Additionally anti-epileptic interventions for challenging behaviour can have serious non-behavioural side effects: Carbamazepine may produce a severely itchy albeit benign rash in individuals within the first few weeks of treatment, and although rare, Stevens-Johnson syndrome and toxic epidermal necrolysis can also occur as an effect of treatment; in a small number of individuals sodium valproate can cause liver damage, and there are reports that link it to polycystic ovarian disease (Santosh & Baird, 1999). Topiramate is also associated with adverse effects such as suppression of appetite and has been reported to produce renal stones in 3% of people who take it (Santosh & Baird, 1999). Such adverse effects would be extremely detrimental to person quality of life.
As Kennedy and Meyer (1998) have noted there is little empirical evidence to support the effectiveness of anticonvulsants on challenging behaviours. Interestingly the Monthly Index of Medical Specialties Ireland (2008) makes no reference to the use of anti-epileptics for challenging behaviours, indicating that they should be used solely for the purpose of managing epilepsy and seizures in individuals with intellectual difficulties rather than interventions for challenging behaviours. Given the lack of recent support for the use of anticonvulsants as an intervention for challenging behaviours and their severe adverse effects, it is concluded that they do not work, and their use is only recommended in epileptic patients with intellectual disabilities under strict observation.

Antidepressants as interventions for challenging behaviour

Practitioners commonly employ antidepressants, specifically selective serotonin re-uptake inhibitors (SSRIs) as a treatment for challenging behaviour among adults with intellectual disabilities (Antonacci et al., 2008; Deb, 2006). These medications have been shown to be effective in reducing irritability and self-injurious behaviour (Antonacci et al., 2008; Deb, 2006), however responses are varied. While Janowski, Shetty, Barnhill, Elamir and Davis (2005) retrospectively observed a marked decrease in self-injurious and destructive behaviours on SSRI paroxetine, Branford, Bhaumik and Naik (1998) found no significant benefit of either paroxetine or fluoxetine, observing that some patients exhibited a worsening of challenging behaviour.

Similar to other medications used for challenging behaviour antidepressants also elicit unpleasant side effects. Paroxetine, though demonstrating some effectiveness on challenging behaviour, can list somnolence, insomnia, tremor, dizziness, and asthenia among its adverse effects (MIMS Ireland, 2008), indicating that it may not be the most beneficial addition to an intervention plan for challenging behaviour.

Antidepressant medication has shown varying degrees of effectiveness in reducing challenging behaviour, particularly with regard to self-injurious behaviours. However, as with antipsychotic and anticonvulsant medications there is a noticeable lack of stringently controlled trials. Without strong evidence from such trials and in light of the side effects, it is in sensible to state that antidepressant interventions for challenging behaviour work.

Conclusion

As noted by Ulzen & Powers (2008) it would be a grave error to attribute challenging behaviours seen in these individuals to their intellectual disability, denying them treatment for what may be a coexisting psychiatric illness. Yet large
numbers of individuals with intellectual disabilities and challenging behaviour who have no conspicuous mental illness receive psychotropic medication (Brylewski & Duggan, 1999). It must also be stressed that brief or self-limiting challenging behaviours, that may reflect physical health problems, or environmental or personal stressors do not merit such prescription (O’Brien & McKinnlon 2009). However, given the prescription prevalence of psychotropic medications for individuals with intellectual disabilities, there is a risk that these medications may be used instead of suitable behavioural interventions in order to avoid excessive resource costs (Ulzen & Powers, 2008; Marshall, 2004).

This paper proposes that the evidence in support of the use of pharmacological interventions for challenging behaviours is presently lacking. It observes that such interventions are often associated with imprecise treatment effects and severe side effects. Although certain antipsychotic medications have been shown to reduce challenging behaviour, it is unclear whether this is a drug induced result or as a by-product of the sedative effect. Review studies have also indicated that some forms of anticonvulsant medications may be beneficial; however these treatments are associated with very severe physical side-effects and can on occasion worsen the target behaviours. Antidepressants have also demonstrated some effectiveness in reducing target challenging behaviours, but there is inconsistency in the literature raising doubt over intervention viability. At present there is no definitive evidence to suggest that pharmacological interventions can ameliorate challenging behaviour. There is a distinct lack of randomized controlled trials for all medications with regard to challenging behaviour. In addition, these behaviours tend to be long lasting and recurrent, yet few studies provide long term follow up for their interventions, therefore it is impossible to know whether there is any long-term benefit to individuals exhibiting challenging behaviour (Deb et al., 2007). It is recommended that pharmacological interventions for challenging behaviours should be used sparingly particularly when no mental illness is present. Should there be no available alternative to pharmacological intervention it is paramount that the extent and form of drug intervention, as well as the characteristics of those who are medicated, be subject to on-going scrutiny, on a case specific basis (McGillivray & McCabe, 2004).

References


