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Behaviour Management Problems as Predictors of Psychotropic Medication and Use of Psychiatric Services in Adults with Autism

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Abstract We examined behaviour management problems as predictors of psychotropic medication, use of psychiatric consultation and in-patient admission in a group of 66 adults with pervasive developmental disorder (PDD) and intellectual disability (ID) and 99 controls matched in age, gender and level of ID. Overall, people with PDD had higher rates of most DAS behaviour problems and more frequent use of anti-psychotics than matched controls. Logistic regression analyses showed that physical aggression and problems such as pestering staff independently predicted use of anti-psychotics. Physical aggression and overactivity predicted further involvement of psychiatric services. PDD diagnosis predicted admission to an in-patient unit. The results suggest that externalizing problem behaviours in adults with autism can predict type of treatment intervention.

Keywords Autism · Behaviour management problems · Challenging behaviour · Intellectual disability/ mental retardation · Psychotropic medication · Treatment interventions

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Autism and related pervasive developmental disorders has received increasing attention over the last 20 years. This reflects the dramatic increase in administrative prevalence of autism (Fombonne, 1999; 2003) and concomitant increase in service provision in early intervention, special education and adult services. Considerable attention has focussed on early intervention (New York Department of Health, 1999) and clinical outcomes (Billstedt, Gillberg & Gillberg, 2005; Howlin, 2003). Less attention has been focussed on behaviour problems as predictors of treatment intervention in adults with pervasive developmental disorder (PDD). Aggressive, self-injurious, destructive, and other dysfunctional or socially unacceptable behaviours are particularly common when PDD co-exists with intellectual disability (ID) (McClintock, Hall & Oliver, 2003). Recent meta-analytic studies suggest that antipsychotic medication may be of benefit for behavioural problems associated with PDD (Dinca, Paul & Spencer, 2005), however it remains unclear whether particular behavioural problems *per se* (i.e. independently of PDD) are likely to receive such treatment.

Evidence suggests that problem behaviours such as physical aggression and temper tantrums are predictors of use of psychiatric and behavioural services in adults with ID (Aman, Sarphare & Burrows, 1995; Singh, Ellis & Wechsler, 1997). Anti-psychotic medication is also frequently prescribed in adults with ID to control problem behaviours in the absence of mental illness (Bouras, 1999; Gray & Hastings, 2005). Relatively little is known about the use of mental health services by adults with PDD and ID. Given the general trend for large institutions to close, more research is needed on people with PDD and ID living in community settings

receiving psychiatric and behavioural services (Hans'on, Weisler, Lakin & Braddock, 2002). Therefore, the aim of this study was to evaluate behaviour problems as predictors of psychiatric service use in adults with PDD and ID living in community settings. In the present study we focused on three main interventions widely available for this client group through the National Health System (NHS): psychotropic medication, psychiatric consultation and hospital admission.

Methods

Participants and Settings

All the participants (N = 168) were referred for assessment to a Specialist Mental Heath Service of South-East London. The inclusion criteria were: intellectual disability (F70–73), presence of behaviour problems, and a PDD diagnosis (for the PDD group). Exclusion criterion for this study was the presence of an additional psychiatric disorder, such as depression, schizophrenia spectrum, anxiety, personality disorder etc. The presence of those disorders was established following clinical interviews. Diagnoses were based on ICD-10 criteria. This exclusion criterion was adopted in order to establish that behaviour problems were not caused by psychiatric problems.

On the basis of the above criteria we selected 69 adults with PDD and 99 controls (i.e. adults with ID but without PDD) matched in age (PDD group: mean = 34.6, SD = 11.7 - Control group: mean = 34.3, SD = 12.1), gender (PDD group: 63.8% male, 36.2 % female - Control group: 64.7 % male, 35.3% female) and level of ID (PDD group: 26.3% Mild, 35.4 % Moderate, 38.4% Severe - Control group: mean = 26.1% Mild, 36.5% Moderate, Severe 37.4.%) according to ICD-10 criteria (F70–73). Matched controls were selected on a case-by-case basis so that they matched a participant with PDD in age, gender and level of ID. The PDD diagnosis (F84, ICD-10) was made by a psychiatrist following clinical interviews with key informants and the patients as part of delivering clinical service. Two experienced psychiatrists agreed on the PDD diagnosis by using clinical criteria of ICD-10. Additional historical details of early social and communication problems were obtained from past medical records.

Data Recording

The clinical and demographic data were recorded at initial assessment using a specially devised assessment and information rating profile. The variables were: age group, gender, epilepsy, degree of ID, diagnosis of PDD and medication. Medication was coded into the following categories: 'anti-psychotics', 'sedatives', 'anti-convulsants', 'PRN only' (pro re nata – 'as needed' medication), 'combinations' and 'none'.

Rating of Behaviour Problems

Behaviour problems were assessed through the Disability Assessment Schedule (DAS; Holmes et al., 1982). The DAS was developed in order to assess the level of functioning in people with learning disabilities. DAS behaviour problems are operationally defined as situations when members of staff have to intervene, causing upset to others, or having marked effect on the social atmosphere. The DAS_behavioural problems scale (DAS-B) consists of the following items: 'physically aggressive to others', 'destruction of furniture, clothing windows etc', 'over-activity', 'pesters staff and others', 'self injury', 'wanders or runs away if unsupervised', 'screams or makes other disturbing noises', 'temper tantrums or verbal abuse', 'disturbing others at night', 'objectionable personal habits' (e.g. spits, smears, self-induced vomiting, eats rubbish, inappropriate swearing or sexual behaviour, hoards rubbish, difficult or objectionable habits with menstruation) 'scatters or throws objects around', 'antisocial/delinquent behaviour' (e.g. steals, lies, bullies, incites others), 'sexual delinquency' and 'other problems'. Items were rated as 'absence' or 'presence' reflecting the clients' behaviour over the last 3 months. Ratings were completed by key informants, such as family and professional carers. DAS-B was shown to have good internal consistency (a = .87) in the present sample.

Data Analysis

Before the analysis, dummy variables were created for each variable, coded as presence (1) or absence (0). The obtained categorical data were analysed by chi-square tests to examine statistically significant differences between the autistic and non-autistic group. Then, in order to examine whether different types of psychiatric service use (i.e. medication, further involvement from psychiatry, admission to an inpatient unit) were predicted by a diagnosis of PDD per se or by specific behaviour problems for which there were significant group differences, a set of binary logistic regression analyses was performed using a stepwise forward method. In this method, the predictor variables (i.e. PDD diagnosis and behaviour problems) were added successively according to their magnitude of the correlation with the dependent variable, and

then were successively removed until the predictive ability of the regression model, indexed by the model chi-square, was not significantly improved. The Statistical Package for Social Sciences (SPSS 11.1) was employed for all the analyses.

Results

Table 1 presents the proportion of behaviour management problems for the PDD and control groups. People with PDD were more likely to be aggressive ($\chi^2 = 21.84$, $p < .001$), destructive of furniture and clothing ($\chi^2 = 19.61$, $p < .001$), and overactive ($\chi^2 = 8.96$, $p < .01$) as compared to controls. Moreover, a significantly larger proportion of people with PDD had problems with pestering others ($\chi^2 = 13.81$, $p < .001$), self-injury ($\chi^2 = 11.26$, $p < .001$), wandering/running away ($\chi^2 = 3.51$, $p < .05$), screaming (χ^2 5.74, $p < .01$), temper tantrums/verbal abuse ($\chi^2 = 14.15$, $p < .01$), and disturbing others at night ($\chi^2 = 16.69$, $p < .001$). There were also non-significant trends for objectionable personal habits ($\chi^2 = 3.08$, $p = .08$), scattering/ throwing objects ($\chi^2 = 2.16$, $p > .10$), antisocial behaviour ($\chi^2 = 2.43$, $p > .10$), and sexual delinquency/problems ($\chi^2 > 1$) to be more common in adults with PDD.

Table 2 presents information on prescribed medication for PDD and control group, proportion of further involvement from psychiatry of ID, and admissions to an inpatient unit. Overall, a significantly larger proportion of people with PDD received psychotropic medication ($\chi^2 = 3.78$, $p < .05$) as compared to controls. People with PDD were more likely to receive anti-psychotics ($\chi^2 = 7.77$, $p < .005$) than controls. In addition, a significantly smaller proportion

of people with PDD took anti-convulsants ($\chi^2 = 8.11$, $p < .01$). There were no statistically significant differences between the two groups with respect to combinations of medications ($\chi^2 = 1.54$, $p > .20$), sedatives ($\chi^2 < 1$) and PRN medication ($\chi^2 = 1.59$, $p > .20$). Compared to controls, a larger proportion of people with PDD received further involvement form the psychiatry of ID ($\chi^2 = 8.71$, $p < .01$) and were admitted to an inpatient unit ($\chi^2 = 8.98$, $p < .01$).

The above analyses suggested that there were differences between people with PDD and matched controls in anti-psychotic medication, maladaptive behaviours, inpatient admission and further involvement from the ID psychiatry. However, it is unclear whether these differences can be predicted by the diagnosis of PDD *per se* or by specific behaviour problems. To further examine this, a set of forward logistic regression analyses was performed. In all regression equations diagnosis of PDD (absence/presence) and behaviour problems which had been shown to be sensitive to group differences (as suggested by the previous dichotomous analyses) were entered as predictor variables.

The results from the logistic regression analyses are summarized in Table 3. In the first regression analysis, 'anti-psychotic medication' was entered as the dependent measure. The overall model was significant ($\chi^2 = 16.84$, $df = 2$, $p < .001$, -2 Log likelihood = 167.58) accounting for about 14 % of the variance (Nagelkerke R^2). In this model, only 'physical aggression' and 'pestering staff or others' were significant predictors. In the next regression analysis, 'admission to inpatient unit' was entered as a dependent measure. The model was significant ($\chi^2 = 9.50$, $df = 1$, $p < .001$, -2 Log likelihood = 60.68) accounting for about 16% of the variance. In this model, only 'PDD diagnosis' was a

Table 1 Proportion of DAS behaviour problems across the two groups	Type of behaviour problem	Group	
		PDD n (%)	Control n (%)
	Physically aggressive to others	43 (62.3%)	6 (26.3%)
	Destructive of furniture and clothing	40 (58.0%)	24 (24.2%)
	Overactive, does not sit still	32 (46.4%)	24 (24.2%)
	Pesters staff or others	40 (58.0%)	29 (29.3%)
	Self injury, head banging	27 (39.1%)	16 (16.2%)
	Wanders or runs away	15 (21.7%)	11 (11.1%)
	Screams or makes disturbing noises	35 (50.7%)	32 (32.3%)
	Temper tantrums or verbal abuse	44 (63.8%)	34 (34.3%)
	Disturbs others at night	31 (44.9%)	16 (16.2%)
	Objectionable personal habits	18 (26.1%)	15 (15.2%)
	Scatters or throws objects	15 (21.7%)	13 (13.1%)
	Antisocial, delinquent	9 (13.0%)	6 (6.1%)
	Sexual delinquency or problems	5 (7.2%)	9 (9.1%)

Table 2 Group differences in type of medications, further involvement from psychiatry of ID and admission to inpatient unit

Variable	Group	
	PDD n (%)	Control n (%)
Psychotropic medication		
Anti-psychotics	24 (34.8%)	16 (16.2%)
Sedatives	3 (4.3%)	2 (2.0%)
Anti-convulsants	7 (10.1%)	28 (28.3%)
PRN only	5 (7.2%)	3 (3.0%)
Combinations	14 (20.3%)	13 (13.1%)
None	16 (23.2%)	37 (37.4%)
Further involvement from psychiatry of ID		
Yes	53 (76.8%)	54 (54.4%)
No	16 (23.2%)	45 (45.5%)
Admission to inpatient unit		
Yes	8 (11.6%)	1 (1.0%)
No	61 (88.4%)	98 (99.0%)

Table 3 Regression models for predicting anti-psychotic medication, admission to inpatient unit, and further involvement from psychiatry

Variable	B	SE	Exp (B)	95% CI	*P*
Anti-psychotic medication					
Physically aggressive to others	1.05	0.41	2.85	1.30 - 6.24	< 0.01
Pesters staff or others	0.84	0.40	2.33	1.06 - 5.08	< 0.05
(Constant)	–2.08	0.33			
Admission to inpatient unit					
PDD diagnosis	2.55	1.07	12.85	1.56 - 105.25	< 0.05
(Constant)	–7.14	2.04			
Further involvement from psychiatry					
Physically aggressive to others	0.84	0.38	2.32	1.08 - 4.95	< 0.05
Overactive, does not sit still	1.37	0.45	3.92	1.63 - 9.48	< 0.01
(Constant)	–0.11	0.21			

significant predictor. People with PDD were more likely to be admitted to an inpatient unit, after statistically controlling for the presence of maladaptive behaviours. In the third regression analysis, 'further involvement from psychiatry' was entered as a dependent measure. The model was significant ($\chi^2 = 24.07$, $df = 2$, $p < .001$, –2 Log likelihood = 196.06) accounting for about 18% of the variance. However, 'physical aggression' and 'overactive behaviour' were the only significant individual predictors.

Discussion

The present study examined behaviour problems in people with PDD and ID as predictors of type of treatment intervention. Overall, people with PDD had more problem behaviours (see also McClintock et al., 2003) and were more likely to receive psychotropic medication, than matched controls despite the absence of psychiatric disorders (exclusion criterion). Behaviour problems predicted use of psychiatric services, such as use of psychotropic medication and further

psychiatric consultation. Specifically, 'physical aggression to others' and 'pestering staff or others' predicted the use of anti-psychotics, while 'physical aggression' and 'overactivity' predicted further involvement from psychiatric services. A diagnosis of PDD predicted only in-patient admission. These results are similar to previous research with adults with ID showing that challenging behaviours predict use of psychotropic medication (Aman et al., 1995, Singh et al., 1997) and use of other psychiatric services (Sturmey & Adams, 1999). The present results also suggest that that challenging behaviours are also important risk factors for psychiatric services in intellectually disabled adults with autism.

Psychotropic medication was found to be more frequent in the autistic group, a result that concurs with past evidence (Posey & McDougle, 2000). This may reflect pressures to prescribe medication in cases of greater complexity, despite the absence of overt clinical psychopathology. The present results also suggest that the presence of specific externalising behaviour problems (i.e. physical aggression and pestering staff) accounted for the prescription of anti-psychotic

medication in the absence of a psychotic illness. Second-generation anti-psychotic medication has shown some effectiveness in the improvement of challenging behaviour in people with autism (for a review see Kwok, 2003), although the psycho-physiological mechanism responsible for this effect remains little understood and adverse reactions are not uncommon.

The regression analysis of in-patient admission identified only one predictor of admission (i.e. a diagnosis of PDD) while challenging behaviors did not independently predict in-patient admission. This finding may seem surprising considering the absence of mental health problems in the present sample. One possibility is that risk factors/behaviours associated with PDD were not tapped by the study's instruments. Another possibility is that the diagnosis of autism during clinical assessment may have overshadowed other co-existing psychiatric diagnoses, which perhaps made hospital admission more likely for this group. Considering the range of communication problems in autism (Howlin, 1997), the possibility of an under-diagnosis remains a challenge for future investigations to overcome.

The present results suggest that prevention and management of physical aggression as well as other problem behaviours should be an imperative focus of community services. Particularly, evidence suggests that behavioural interventions are effective for such problems (Carr, Horner, & Turnbull, 1999; Didden, Duker, & Korzilius, 1999; Scotti, Evans, Meyer, Walker, 1991). Interventions based on a functional assessment of the target behaviour and its relationship to environmental variables that control these behaviours are especially likely to be effective (Didden et al., 1999; Hanson et al., 2002).

There were a number of limitations to this study. The range of variables included in the regression analyses was limited to client maladaptive behaviors measured on the DAS. Thus, other internally directed maladaptive behaviors and other client factors were not included. Likewise, variables related to services and attitudes among the professionals were not included. Such variables might be important predictors of use of psychiatric services by adults with autism and future research should develop measures of these variables. Finally, the present study focused on only a limited range of psychiatric services (i.e. psychotropic medication, psychiatric consultation and hospital admission) from a broad spectrum of interventions. It would be therefore particularly informative for future studies to include a larger range of interventions and treatments programmes.

In summary, the present findings suggest that both behavioural management problems and psychotropic medication are increased in adults with autism. Importantly, specific types of behavioural problems predict the use of anti-psychotics and continuing psychiatric input. Challenging behaviours are important risk factors for service users and service providers. Health care provision should focus on developing preventive interventions and behavioural intervention packages when challenging behaviours exist. Psychotropic medication for this client group is controversial, although there is a literature that supports its use when carefully monitored and as a part of a comprehensive care package.

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