

Management of self-injurious behaviour, reducing restrictive interventions and predictors of positive outcome in intellectual disability and/or autism

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SUMMARY

Perceptions of self-injurious behaviour as refractory to treatment, and of treatment outcomes as unpredictable, in children and adults with intellectual disabilities and/or autism may lead to treatment inertia or nihilism, restrictive practices and overuse of psychotropic medication in its management. Recent research suggests, however, that from infancy to young adulthood prospects for a positive outcome are fair, and markers predictive of treatment outcome have begun to be identified. In this clinical reflection we briefly describe this work, consider how it may contribute to case stratification, and outline current thinking on further functional differentiation of cases of SIB, promoting non-restrictive practices.

KEYWORDS

Self-injurious behaviour; reducing restrictive intervention; predictors of outcome; autism; intellectual disability.

Yates (2004) defines self-injurious behaviour (SIB) as comprising self-inflicted non-accidental acts causing damage to or destruction of body tissue and carried out without suicidal ideation or intent. Accessing appropriate help for this behaviour in children and adults with intellectual disabilities and/or autism is difficult, with geographical variations in availability of relevant expertise. Perceptions that SIB is typically chronic and refractory to intervention and the absence of any reliable predictor of individual responsiveness to treatment are also important factors. However, recent research has given grounds for optimism on both issues.

Chronicity of self-injurious behaviour

In adults with intellectual disabilities, SIB does indeed appear often to be a chronic problem, with

persistence rates around 70–80% over periods of up to 20 years, although even in adulthood a substantial minority of those engaging in self-injury later cease to do so. In children at risk for developmental delay, those who begin to self-injure often do so by age 12–24 months, but between very early childhood and the primary school years, approximately half of these children stop self-harming (Baghdadli 2008). Furthermore, between the early secondary school years and young adulthood, approximately 50% of individuals with autism who self-injure similarly cease to do so (Laverty 2020). Although the part played by services in helping people to control SIB is as yet unclear, these findings suggest that many children can overcome self-injury and that intervention with young people should be prioritised.

Principles of behavioural intervention

Behavioural interventions for self-injury are based on the premise that the behaviour is often maintained by socially mediated reinforcement, i.e. acquisition of instrumental/communicative functions. The success of interventions based on this premise has led to the further assumption that in cases where no socially mediated reinforcement of the behaviour can be discerned, self-injury is maintained by ‘automatic reinforcement’, i.e. sensory or other consequences directly resulting from the behaviour itself.

Functional assessment

Functional assessment is the foundation of behavioural intervention. It should, however, be preceded by the taking of a detailed history, including consideration of health conditions, life events and potentially treatable comorbid conditions such as sleep difficulties, pain and impulsivity/overactivity (Fig. 1). The aim of functional assessment is to

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identify events that typically precede and follow episodes of self-injury in order to form a hypothesis regarding factors eliciting and maintaining the behaviour. Initial hypotheses can be developed from discussion with parents/carers (or the person concerned) using semi-structured interview schedules, while further information on events preceding and following episodes of SIB may be collected by asking parents/carers (or the person concerned) to complete an Antecedent–Behaviour–Consequence checklist. Hypotheses developed regarding the function(s) of SIB can be further evaluated by use of brief rating scales such as the Questions About Behavioral Function scale.

Intervention

Once events reinforcing self-injury have been identified by functional assessment, there are two principal intervention options. The first is to reduce the power of the reinforcer that is maintaining self-injury by simultaneously reducing its motivational value and breaking the link between engaging in self-harm and gaining access to the event. This is achieved by non-contingent reinforcement (NCR), i.e. providing the person with the reinforcer maintaining self-injury on a schedule largely independent of the occurrence of the behaviour. Typically, the hypothesised reinforcer (e.g. social interaction with carers) is initially provided continuously, and then provided on a schedule that is progressively ‘thinned’ over time (e.g. 50 s of interaction in each minute, then 40 s, then 30 s and so on). Provided that the reinforcer has been correctly identified, carefully planned NCR is an effective method for rapidly reducing levels of self-injury. The second treatment option for reinforcement-maintained self-injury is functional communication training (FCT), which aims to teach, and/or encourage the person to use, communicative behaviours that serve the same function as the self-injury. FCT has been shown to be effective in reducing self-injury maintained by socially mediated consequences such as social interaction, gaining access to preferred items or activities and being enabled to get away from unpleasant situations (Hagopian 2011).

Both interventions have drawbacks. There are theoretical grounds for concern that although NCR may reduce self-injury in the short term, if carers continue also to provide the reinforcer in response to self-injury, in the longer term NCR may actually increase its persistence. NCR is therefore best used as a short-term option to reduce self-harm while longer-term interventions are developed and introduced. With FCT, levels of self-harm may increase again if the communicative response does not reliably produce the

maintaining consequence. Hagopian et al (2011) provide guidance on developing individualised strategies to manage these difficulties, and a combination of NCR and FCT interventions can produce meaningful reductions of self-injury in many cases.

Predicting positive response to reinforcement-based behavioural intervention

As both NCR and FCT require identification of the specific reinforcer maintaining the self-injury, they are more difficult to implement in the more than 25% of cases in which automatic reinforcement of the behaviour is hypothesised. Reinforcement in these cases is hypothesised to be a mechanical consequence of self-injury, but it is rarely possible to be certain as to which aspect of the consequences is critical in maintaining the behaviour. The form of the self-injury may offer clues (e.g. eye-poking may be maintained by the visual stimulation it produces). In most cases however, behavioural interventions use reinforcers selected on the basis of a systematic assessment of the person’s preferred activities, stimulation and consumables, which are then used in NCR or FCT intervention.

Intervention is less likely to be successful in cases of self-injury maintained by automatic reinforcement than in cases where the behaviour is socially reinforced (Iwata 1994), and this effect has traditionally been ascribed to difficulty in identifying the reinforcer. The benchmark technique for this identification in applied behaviour analysis is experimental functional analysis, in which levels of self-injury are observed while the person who self-injures is briefly exposed to arranged social environments in which antecedent conditions of interest are reliably present and the person’s self-injurious behaviours are reliably followed by a specified consequence. For example the antecedent condition may be a carer being present but preoccupied with another task rather than interacting with the person, and the consequence a brief period of interaction if the person starts to self-injure. Traditionally, automatic reinforcement has been identified as the cause of self-injury if the behaviour occurs at high levels across all conditions of an experimental functional analysis (the person is observed when alone and without any means to occupy themselves) and, for example, when they are provided with stimulation or social interaction.

Recently, however, Hagopian et al (2018) have shown that cases in which levels of self-injury are higher in an ‘alone’ condition than in a more stimulating environment usually respond well to

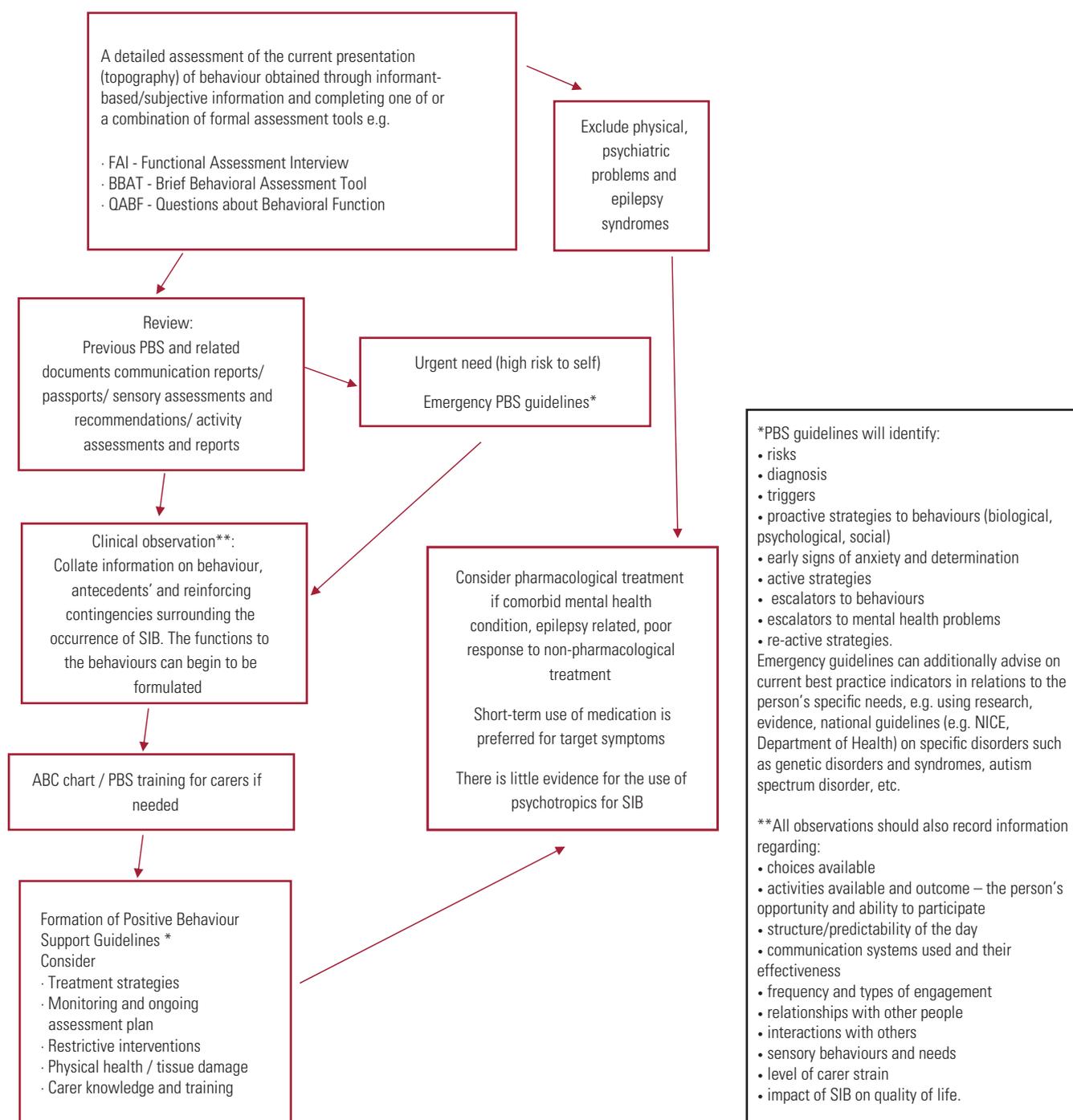


FIG 1 Care pathway for individuals with self-injurious behaviour (SIB). ABC, Antecedent–Behaviour–Consequence checklist; PBS, positive behaviour support. Adapted with permission from a pathway produced by the Leicestershire Partnership NHS Trust Positive Behaviour Support Pathway Development Group.

reinforcement-based interventions, whereas those in which levels are high across all conditions in an experimental analysis rarely do so. This identification of a predictive behavioural marker for response to reinforcement-based intervention represents a first step towards effective stratification for treatment in cases of automatically reinforced self-injury.

Further steps towards stratification for treatment

Hagopian et al's (2018) research raises the issue of whether it is possible to identify other potential markers of responsiveness to treatment for self-injury. Even where experimental analyses identify

TABLE 1 Convergence of proposals for stratification of cases of self-injurious behaviour (SIB)

Mace & Mauk (1995) (cited in Furniss 2020)	Operant SIB		Stereotyped SIB	High-rate SIB with agitation	High-rate SIB with agitation when interrupted
Aman et al (2005) (cited in Furniss 2020)		Impulsive SIB		Compulsive SIB	
Hagopian et al (2018)	Socially reinforced SIB and automatically reinforced SIB subtype 1	Automatically reinforced SIB subtype 2		Automatically reinforced SIB subtype 3	
Furniss & Biswas (2020)	Operant/instrumental SIB	Habitual/impulsive SIB	Stereotyped SIB	Compulsive SIB	

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external sources of reinforcement as maintaining the self-injury, function-based behavioural treatments are not efficacious in 6–11% of cases (Iwata 1994). Several clinical attempts to further delineate treatment-relevant subtypes of self-injurious behaviour (Table 1) have yielded some consensus on a distinction between individual cases where self-injury is primarily maintained by reinforcement, or has evolved into a habitual or impulsive response to interpersonal or environmental challenges, or has become ‘compulsive’ (such that the person is driven to attempting to physically restrain themselves from self-injuring). The presence of self-restraint may therefore be a further predictive behavioural marker for resistance to reinforcement-based intervention (Hagopian 2018). No comparable marker has yet been identified for cases where self-injury may have evolved into a habitual/impulsive response to specific situations, although we (Furniss 2020) have recently suggested that failure to respond positively to a brief trial of NCR may be a clinically useful indicator.

Differentiating treatments

Although predictors of resistance to reinforcement-based interventions may help to avoid committing the energies of families and other carers to interventions when prospects of success are limited, the benefits of identifying predictive behavioural markers would increase enormously if they could also identify cases where alternative treatments might be effective. Case studies have described progressive exposure to the eliciting situation using a hierarchy of steps (organised as task steps or along dimensions such as degree or duration of exposure to the situation) as helpful for self-injury evoked by particular environmental situations, and such interventions may be specifically helpful for cases of habitual/impulsive self-injury.

Further research is needed to determine whether the potential behavioural indicators described

above are indeed able to distinguish individuals who will benefit from reinforcement-based versus exposure-based interventions. In the meantime, clinicians should seek skilled behavioural intervention for young people who self-injure and consider behavioural predictors of outcome in treatment planning, including stopping over-medication in people with intellectual disability, autism or both (Royal College of Psychiatrists 2021).

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References

Baghdadli A, Picot MC, Pry R, et al (2008) What factors are related to a negative outcome of self-injurious behaviour during childhood in pervasive developmental disorders? *Journal of Applied Research in Intellectual Disabilities*, 21: 142–9.

- Furniss F, Biswas AB (2020) *Self-Injurious Behavior in Individuals with Neurodevelopmental Conditions*. Springer Nature.
- Hagopian LP, Boelter EW, Jarmolowicz DP (2011) Reinforcement schedule thinning following functional communication training: review and recommendations. *Behavior Analysis in Practice*, **4**: 4–16.
- Hagopian LP, Rooker GW, Yenokyan G (2018) Identifying predictive behavioral markers: a demonstration using automatically reinforced self-injurious behavior. *Journal of Applied Behavior Analysis*, **51**: 443–65.
- Iwata BA, Pace GM, Dorsey MF, et al (1994) The functions of self-injurious behavior: an experimental-epidemiological analysis. *Journal of Applied Behavior Analysis*, **27**: 215–40.
- Laverty C, Oliver C, Moss J, et al (2020) Persistence and predictors of self-injurious behaviour in autism: a ten-year prospective cohort study. *Molecular Autism*, **11**: 8.
- Royal College of Psychiatrists (2021) *Stopping the Over-Medication of People with Intellectual Disability, Autism or Both (STOMP) and Supporting Treatment and Appropriate Medication in Paediatrics (STAMP) (Position Statement PS05/21)*. Royal College of Psychiatrists.
- Yates TM (2004) The developmental psychopathology of self-injurious behavior: compensatory regulation in posttraumatic adaptation. *Clinical Psychology Review*, **24**: 35–74.