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Multicomponent treatment for blood-injury-injection phobia in a young man with mental retardation

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Abstract

Blood-Injury-Injection Phobia (BIIP) is a subtype of specific phobia, characterized by fear and avoidance of seeing blood, an injury, or receiving an injection. In the current case report, we describe the treatment of BIIP in a young man with mental retardation. The multicomponent treatment consisted of fading (graduated exposure), modeling, noncontingent and differential reinforcement, presession anxiolytic medication, and topical analgesic cream.

Keywords: Blood-injury-injection phobia; Fading; Graduated exposure; Developmental disabilities

1. Introduction

There is widespread recognition that individuals with developmental disabilities are at increased risk for the development of psychiatric disorders (Borthwick-Duffy, 1994). The presence of anxiety and anxiety disorders in this population has received increased attention in recent years (Matson, Smiroldo, Hamilton, & Baglio, 1997; Ollendick, Oswald, & Ollendick, 1993). One of the challenges in diagnosing the presence of anxiety disorders in this population is determining whether problem behaviors such as avoidance, ritualistic behaviors, or disruptive outbursts are due to an anxiety disorder or secondary to the

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developmental disability. In addition, these individuals' limited abilities to accurately label and verbally express subjective states make it difficult to diagnose an anxiety disorder in some cases (Matson et al., 1997).

The majority of published studies on the treatment of anxiety in this population have reported on interventions targeting specific phobias (Arntzen & Almas, 1997; Erfanian & Miltenberger, 1990). To date, no study has reported on the treatment of blood-injury-injection phobia (BIIP) in individuals with developmental disabilities. In the DSM-IV, BIIP is classified as a subtype of specific phobia characterized by fear/avoidance of seeing blood, an injury, or receiving an injection (DSM-IV; American Psychiatric Association, 1994). In addition, exposure to the stimulus results in an immediate anxiety response; the situation is either avoided or endured with extreme anxiety; the fear and avoidance interferes with the individual's functioning; the duration is at least 6 months; and is not explained by another anxiety disorder. BIIP is also associated with an unusually high prevalence of fainting (70–80% of cases). Estimates of the prevalence BIIP range from 3 to 4% in the general population; however, there are no data on the prevalence of BIIP among individuals with developmental disabilities (Öst & Hellstrom, 1997).

Öst and colleagues have published the majority of treatment studies on BIIP (see Öst & Hellstrom, 1997 for a review). The treatment package developed by Öst involves exposure, modeling, and "applied tension," a straining procedure used to increase blood pressure to prevent fainting. For cases in which fainting is not part of the anxious response, the applied tension procedure is not used. In the current study, we describe the treatment of BIIP in a young man with moderate mental retardation.

2. Method

2.1. Subject and setting

Patrick was a nineteen year old male with moderate mental retardation, intermittent-explosive disorder, and cerebral palsy admitted to an inpatient unit for the assessment and treatment of severe behavior problems including property destruction, aggression, and noncompliance with medical procedures. Upon admission, Patrick was on the following five psychotropic medications targeting his property destruction and aggression: clomipramine (300 mg), naltrexone (200 mg), clonodine (0.8 mg), risperidone (5 mg), and alprazolam (4 mg). Patrick also met DSM-IV criteria for specific phobia, blood-injury-injection subtype. He exhibited panic-like responses (shaking, sweating, and avoidance) when told he was going to receive an injection or have blood drawn.

On one occasion when taken to the doctor's office, he destroyed a patient waiting room in an attempt to escape the situation. Although Patrick had been diagnosed with severe kidney reflux and other medical problems, regular monitoring of his status was not possible. In addition, his avoidance of invasive

medical procedures precluded psychopharmacological interventions targeting behavioral problems that required regular monitoring of blood levels to ensure safe and therapeutic dosing. According to his mother's report, these difficulties began approximately 10 years prior to his admission. An attempt to treat Patrick's BIIP on an outpatient basis (at another facility) using Öst's exposure and modeling procedure was unsuccessful. During his inpatient admission for behavioral treatment, it was observed that Patrick would tolerate noninvasive medical procedures such as having vital signs checked and taking medication; however, he frequently sought reassurance that he would not "get a shot" when entering the nurses treatment room.

2.2. Response definitions

Refusals were defined as verbally or physically refusing to cooperate with therapist's prompts at any time during procedure. *Inappropriate behavior* consisted of aggression such as hitting, punching, kicking, pushing, grabbing, headbutting, and throwing objects within 2 feet of a person; and disruption such as throwing objects (not within 2 feet of a person), breaking or ripping objects, kicking or banging on surfaces or objects, and tipping over furniture. Compliance for a session was defined as the absence of refusals or inappropriate behavior. That is, Patrick was considered compliant for the session if he cooperated for the duration of the procedure without any refusals or inappropriate behaviors.

2.3. Data collection and interobserver agreement

A trained observer recorded the occurrences of inappropriate behavior, and refusals. A second observer simultaneously and independently collected data during 77% of the sessions. An exact agreement session was defined as each observer recording the same number of responses during a session. Session-by-session exact agreement percentages were calculated by dividing the number of exact agreement sessions by total number of sessions and then multiplying the quotient by 100. Session-by-session exact agreement for refusals and inappropriate behaviors were each 100%. All assessment and treatment sessions were conducted on the living unit.

2.4. Procedure

2.4.1. Pretreatment

Patrick was informed that it was time to have his blood drawn, and was instructed to enter a room where a nurse was waiting. He received verbal praise contingent on compliance. Inappropriate behavior was ignored. Noncompliance resulted in a verbal prompt to enter the room to have his blood drawn every 30 s.

2.4.2 Treatment

The goal of treatment was to have Patrick voluntarily approach a nurse when instructed to have blood drawn and sit calmly during the procedure without being restrained. Because drawing Patrick's blood could not be done safely unless he

remained still, he was allowed to terminate the session if he asked or if he had any inappropriate behavior. Treatment consisted of fading, modeling, noncontingent access to distracting and preferred items, and a 10-s DRA for compliance. The inter-session interval was a minimum of 5 min.

A 10-s DRA procedure which involved the delivery of a token and social praise was used to reinforce compliance (the DRA interval was faded to 20 sec at Step 12). The tokens could be traded at the completion of the session for preferred items and activities, including soda, television, toys, lunch with staff at Roy Rogers, etc. The preferred items were identified using a verbal preference assessment based on the procedures described by Fisher et al. (1992). Patrick could avoid or escape the procedure if he was noncompliant or engaged in any inappropriate behavior for all Steps except 18–21. If Patrick escaped from the procedure, the current Step was reintroduced during the following session. Therapists modeled the target Steps and received tokens on the same DRA schedule prior to the start of each session.

Because of Patrick's history of highly intense and panic-like behavior in response to medical procedures, it was decided that the use of a papoose would be necessary to successfully expose him to stimuli associated with having blood drawn. The papoose was a padded board approximately 1.5 m in length with a series of wide, overlapping Velcro straps designed to fully restrain an individual from the knees to the neck.

Fading was conducted across two dimensions: the level of restraint used, and the level of intrusiveness of the medical procedure. The first four phases of treatment alternated between increasing the levels of restraint and the levels of intrusiveness of the medical procedure. During the fifth and final phase of treatment, the level of restraint was decreased while the level of intrusiveness of the medical procedure remained high (see Table 1). A changing-criterion design was used across these two dimensions.

During the first phase of treatment, the papoose was faded into the session until Patrick was voluntarily getting into the papoose and getting partially strapped in (Steps 1–5). In the second phase of treatment, stimuli associated with noninvasive medical procedures were then faded into the session while Patrick remained in the papoose (Steps 6–8). Noncontingent and continuous access to preferred videos during sessions was initiated at Step 7 and continued for the remainder of the intervention. During the third phase of treatment, the papoose straps were tightened for increasingly longer periods of time (Steps 9–12). In the fourth phase of treatment, stimuli associated with medical procedures continued to be faded in while Patrick was tightly restrained in the papoose (Steps 13–20). Emla cream (a topical analgesic cream used to numb the skin) was applied to Patrick's arm at the site where his blood was to be drawn approximately 2 hr before the session starting with Step 15. The first successful blood draw was conducted while Patrick was tightly restrained in the papoose at Step 20. An extra dose of Xanax was administered prior to this session and subsequent sessions (except the final session) in an attempt to acutely decrease his level of anxiety.

During the fifth phase of treatment, the level of restraint was faded out until

Table 1
Levels of restraint and medical invasiveness and description of fading steps

Step	Level		Description
	Restraint	Medical	
Restraint Fading			
1	0	0	Patrick on bed without papoose in site
2	1	0	Patrick on bed: Papoose beside bed
3	2	0	Patrick on bed in papoose
4	3	0	Papoose straps present
5	4*	0	Papoose straps on loosely
Medical Fading			
6	4	1	Step 5 w/right arm extended
7	4	2	Step 6 w/pulse taken
8	4	3	Step 6 w/blood pressure (BP) taken (no pulse taken)
Restraint Fading			
9	5	0	Papoose straps tightened for 20 seconds (no pulse or BP)
10	6	0	Papoose straps tightened for 30 seconds
11	7	0	Papoose straps tightened for 40 seconds
12	8	0	Papoose straps tightened for full 60 seconds
Medical Fading			
13	8	2	Step 12 w/pulse taken
14	8	3	Step 12 w/BP taken (no pulse)
15	8	4	Step 12 w/arm extended, pulse and BP taken, Emla cream applied
16	8	5	Step 15 w/mock penetration with pen end
17	8	6	Step 15 w/mock penetration with pen tip
18	8	7	Step 15 w/mock penetration with mock needle. Begin escape extinction
19	8	8	Step 18 w/pre-draw prep (rubber tourniquet and alcohol swab)
20	8	9	Step 19 w/blood draw
Restraint and Medical Fading			
21	4*	9	Step 19 w/fade half of papoose straps, blood draw
22	0	8	No papoose. Patrick in chair, pulse and BP taken, pre-draw prep, Emla cream, and mock needle. Allow escape (through Step 24).
23	0	8	Step 22 w/must sit still in chair with hand around strap
24	0	9	Step 23 w/blood draw

* Steps 5 and 21 were both described as Restraint Level 4 because they were considered equivalent - although not identical.

Patrick was sitting in a chair unrestrained while he was prepared for or had blood drawn. Beginning with Step 22, Patrick was seated in a chair and the escape extinction contingency was withdrawn, so that Patrick could once again escape from the procedure for noncompliance or inappropriate behavior. Beginning with Step 23, the DRA criterion was changed to sitting still in the chair while medical stimuli associated with blood draws were presented. Sitting still was defined as staying seated and keeping one arm around a teddy bear he was holding, while grasping a strap with his other hand to keep his arm stable. During the final Step (Step 24), actual blood draws were conducted while Patrick sat independently in the chair. For safety reasons, a therapist assisted the nurse by placing his palm over Patrick's wrist during the blood draw. During this final session, the extra dose of Xanax was not administered. The duration of the entire treatment was six weeks.

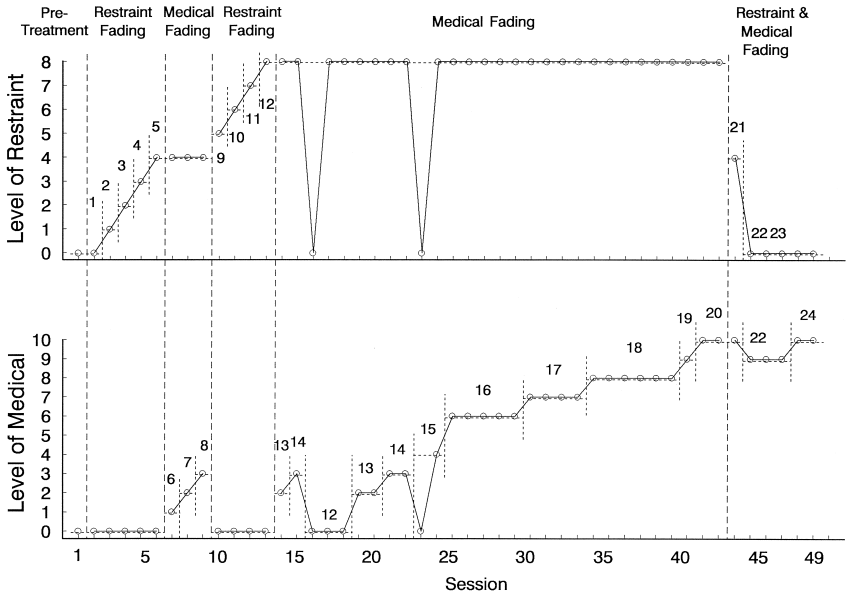

Fig. 1. The top panel depicts the criteria for reinforcement along with the level of restraint. The lower panel represents the criteria for reinforcement and level of invasiveness of the medical procedure. Numbers represent the Step in treatment as described in Table 1.

3. Results

Patrick's progress with treatment, along with the criteria for reinforcement during each session are depicted in Fig. 1. The level of restraint with which Patrick complied is depicted in the top panel, while the level of invasiveness of medical procedures with which Patrick complied is depicted in the bottom panel. The horizontal lines represent the criteria for reinforcement. Only one pretreatment session was conducted because of Patrick's intense panic response.

During the first phase of treatment, Patrick complied with instructions during each session while the level of restraint was gradually increased. During the second phase, Patrick's compliance remained high as he was exposed to progressively more medical procedures while the level of restraint remained constant. During the third phase, Patrick's compliance remained high while the level of restraint was increased by tightening the straps on the papoose and increasing the duration of his restraint. In the fourth phase, while the level of restraint remained at its highest, the level of invasiveness of medical procedures was increased to its highest level (having blood drawn). Patrick refused to comply during sessions 16 and 23. In the final phase, Patrick continued to be compliant while the level of restraint was faded out and the level of invasiveness remained high. During the final two sessions, Patrick sat unrestrained in a chair and complied with having blood drawn. By the time of discharge, the number of

psychotropic medications targeting his problem behaviors was reduced from five to three (naltrexone and clonodine were discontinued).

4. Discussion

In the current study, a graduated exposure procedure involving reinforcement for compliance was used to treat BIIP in a young man with mental retardation. Patrick had a long history of avoidance, anxiety that frequently reached panic proportions, and severe inappropriate behavior associated with medical procedures. These difficulties were highly resistant to outpatient treatment and resulted in his not receiving adequate medical care for several years.

Based on previous observations of Patrick's phobic response, it was believed that exposure to any stimuli signaling that an invasive medical procedure was about to occur would have resulted in avoidance. For exposure to be therapeutic it requires that the feared stimulus is encountered in a controlled manner such that avoidant behavior does not occur and that aversive events previously associated with that stimulus are not experienced. Exposure to the feared stimuli while preventing avoidant behavior and aversive events is believed to result in both extinction of negatively reinforced avoidant behavior as well as extinction of the association between the feared stimuli and the aversive event. Thus, the processes that underlie therapeutic exposure are both operant extinction of avoidant behavior and classic extinction (Hagopian & Ollendick, 1997).

In Patrick's case, it was believed that the only way to prevent him from avoiding stimuli associated with getting blood drawn was to have him restrained during exposure. It was determined that a papoose would be appropriate for this purpose. However, the ultimate goal of treatment was to have Patrick voluntarily permit a blood draw without being restrained. By first having Patrick strapped in the papoose, it was possible to expose him to stimuli that we believed would have resulted in avoidance, panic, or inappropriate behavior. The extra dose of Xanax administered during Steps 21 and 22 was intended to help him better endure the exposure; while the emla cream was intended to decrease any pain that he might have experienced during the procedure. Unfortunately, the design used does not permit one to determine whether the presession dose of Xanax and the emla cream were helpful in the treatment process.

Because Patrick had experienced being physically restrained both manually and using a papoose when invasive procedures were done in the past, we believed he would have refused to voluntarily get into the papoose. Therefore, a stimulus fading procedure was used in order to have Patrick eventually get into a papoose voluntarily and allow himself to be securely strapped in. Once he had successfully contacted reinforcement for getting in the papoose over the course of several sessions, he was gradually exposed to noninvasive medical stimuli and eventually to stimuli associated with having blood drawn. Throughout the majority of sessions, Patrick typically sought reassurance that he would not "get a

shot" before he would lie down on the papoose. Before exposing Patrick to an actual blood draw procedure, two additional components were added to the treatment. First, Patrick could not avoid or escape the session once it was initiated. Second, the extra dose of Xanax was administered prior to session in order to acutely reduce his anxiety and make the exposure easier to endure. In later sessions, he was once again allowed to avoid or escape the session, and reinforcement was provided for sitting still in a chair with no restraint. For the final session, the Xanax was not administered in order to determine whether he could be successful without additional medication or whether it was needed.

A number of limitations of this study should be noted. First, it is not possible to determine the extent to which each of the treatment components contributed to the outcome achieved. In this case, graduated exposure, modeling, reinforcement, temporary restraint, and acute administration of anxiolytic medication were used. Given that treatment took place over the course of 6 weeks, it is not possible to rule out the effects of other variables. Finally, a major limitation of all single case reports is that the findings represent the treatment of a single individual which limits the generalizability.

Despite these limitations, to the authors' knowledge, this study is unique in that it is the only published report on the treatment of BIIP in an individual with mental retardation. Second, the use of the temporary restraint and acute administration of anxiolytic medication to facilitate the exposure process are both novel treatment components. We believe that these two components were critical in this case given the recalcitrant nature of Patrick's phobia as well as his panic response. The utility of such procedures awaits empiric investigation.

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