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Injection Phobia: A Systematic Review of Psychological Treatments

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Abstract. Injectable medications are commonplace but injection phobia can have a detrimental impact on the utilization of health care by patients with subsequent adverse clinical outcomes. This systematic review aimed to identify the various psychological treatments for injection phobia and to assess their effectiveness. A systematic literature search was conducted using Cochrane, PsycINFO, EMBASE, MEDLINE, and AMED databases. Studies with five or more cases that investigated psychological treatment outcomes were selected and assessed in terms of methodological quality, type of intervention and outcomes. Eighty-four publications were identified by the search. Only three studies fulfilled the selection criteria and all used cognitive-behavioural techniques, including exposure to the feared object through a traditional graded hierarchy. Methodology differed but all had optimistic outcomes. Psychological treatments for injection fear or phobia exist, but the overall quality of evidence for treatment effectiveness is poor and outcome measures need consensus and further development.

Keywords: Systematic review, injection, blood-injury-injection phobia, cognitive-behavioural therapy.

Introduction

Injections are used for eradication of endemic disease, maintenance treatment for chronic disease (partly to increase adherence), chemotherapy and contraception. However, some people would "rather die than face the needle" (Marks, 1988). The detrimental impact of injection phobia on utilization of health care exists at both individual and population levels. For some, injection phobia is a reality that adversely limits treatment options, although to date no known studies have specifically investigated this. Injection phobia is characterized by long-term injection fear that is recognized as unreasonable, anticipation or exposure triggering anxiety, injection avoidance, positive family history, cardiovascular symptoms and nausea (Hamilton, 1995). It is currently categorized as a part of "blood-injury-injection phobia" (BII). An epidemiological study estimated the lifetime prevalence of BII as 3.5%, of which 47% had a fear of injections (Bienvenu and Eaton, 1998).

Psychological treatments have been detailed in numerous case reports for patients with BII. In Sweden, Öst conducted a research series to develop psychological treatments for blood phobia but people with a specific injection phobia may not respond to the same treatments. Previous reviews of psychological treatments for anxiety disorders have, at best, only one

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injection phobia study. Thus, this systematic review aimed to identify the various psychological treatments for injection phobia in adults and to assess their effectiveness.

Method

Search strategy

The following electronic databases were searched for publications predating March 2003: Cochrane, PsycINFO, EMBASE, MEDLINE and AMED (Allied and Complementary Medicine). Key terms included: injection, needle, hypodermic, AND fear, phobia, AND psychological treatment, cognitive therapy, behaviour therapy, psychotherapy. Additional searches were conducted for two identified key authors (L. G. Öst and R. Kleinknecht) and citations of two key papers using Web of Science (Öst, Hellstöm and Kåver, 1992; Marks, 1988). A search of "grey" literature was conducted by: (i) search of SIGLE database (ii) checking of websites for patient organizations, (iii) electronic searching of national newspapers (NISS). A hand search was also conducted for an identified key journal *Behaviour Research Therapy*.

Definitions

Injection was defined as including delivery of medication or nutritional substance via a needle or temporary cannula and excluding phlebotomy and aspiration. Dental injections were therefore included. Phobia was defined according to standardized diagnostic criteria (DSM or ICD). Psychological treatment was defined as a specific technique of non-medication therapy with aim to treat/ameliorate non-organic condition or maladaptive behaviour and therefore excluded non-specific counselling techniques.

Criteria

(i) Inclusion criteria: participants aged 18 years and above, condition of injection fear or phobia, intervention of psychological treatment, studies must include five or more participants receiving a target intervention. (ii) Exclusion criteria: studies detailing research on children only, condition of dental phobia or blood phobia only and not specifically identified as also including injection fear or phobia, intervention of physical manipulation of drug delivery system (e.g. innovative technology for needles/injections) or alternative drug delivery system (e.g. topical patches), publications detailing case reports and case series with less than five participants. (iii) Although a comparison group was not essential for included studies, if they did exist, such participants should be subject to an alternative intervention or placebo or "watchful waiting".

Procedure

All identified papers were entered into an Endnote (version 5.0) database and replications were found. Abstracts were reviewed and compared against the criteria (as above). Where no abstract was available, or where no definitive decision could be made on the basis of the abstract alone, the original paper was used. A second independent reviewer also checked

the abstracts and where differences in selection occurred, these were resolved by discussion. Quality analysis for publications considered: recruitment and screening methods, sample size and characteristics, definition used for injection phobia, type of intervention and follow-up duration. Main outcomes and associated measures were assessed.

Results

Eight-four publications were identified by the search methods, of which, 81 were excluded by criteria: 12 not injection phobia, 19 not intervention studies, 6 only on children, 43 case reports. Three papers were included by the criteria and, due to the study designs involved, each publication is considered in turn.

Öst et al. (1992)

This publication described a non-blinded randomized control trial for forty cases divided into two treatment groups: (i) five sessions of exposure therapy and (ii) one prolonged session of intensive exposure therapy. All participants met DSM (IIIR) criteria for simple phobia (blood-injury) with a minimum one-year duration of phobia (injection and venepuncture). However, it is not clearly stated how many specifically had injection phobia as opposed to phobia of needle procedures, which included phlebotomy. The main outcome measure was a newly designed 18-item (likert), 2 sub-scale injection phobia scale but design and validity details were scarce. A statistically significant difference between the two treatment groups for mean reduction of scores was found at post-treatment ($p < 0.001$), but was not maintained at 12 months [see Table 1]. All cases were allowed to partake in a voluntary maintenance programme during the early follow-up phase and it is not specified how many cases actually did so. In 1992, this study would have been considered as having a fairly rigorous method. This is despite the fact that selection bias is evident (with participant self-referral following an advertising campaign), no randomization method details were given, no baseline socio-demographic comparisons were made and the investigators were not blinded. However, as this study did not use a placebo comparison group, it is difficult to assess the respective treatments' effect size.

Coldwell et al. (1998)

Preliminary data on nine participants are presented for a computerized exposure-based weekly therapy (computer assisted relaxation learning, CARL). There was no comparison group. Six participants met criteria for specific phobia (DSM IV) and all had "dental injection fear". It is not clear how many of these have fear of all injections, as opposed to just "dental" injections. All successfully received two dental injections by the end of treatment. A statistically significant reduction in 5-item (likert) University of Washington Dental Fears Research Clinic Needle Survey score was reported at 3 months ($p < .001$), and maintained at 12-month follow-up ($p < .002$, compared to baseline). Details on recruitment and sampling were not provided, thus selection bias may be a serious concern. Almost no information is given regarding methodological rigour and so information bias is a possibility. However, the most significant cause for concern is that participants were a subset of a larger study, which compared cases for effect of alprazolam (versus placebo) on exposure therapy. Thus some participants will have also received alprazolam but the authors remained blinded to case allocation for medication.

Table 1. Summary of studies: participants, interventions and outcomes

Study	Participants	Intervention	Main outcome measures	Findings
Öst et al. (1992) Sweden Randomized control trial, non-blinded	Clinician- and self-referral 44/54 screened met criteria $N = 40$, age 18-60 years, 34 females, 27 full-time employed All met criteria for simple phobia (blood-injury) (DSM IIIR)	5 sessions of exposure treatment (5 × 1 hour sessions maximum) over duration of up to 6 weeks. Includes exposure and rehearsal Compared with 1 session of exposure treatment (up to 3 hours). Includes prolonged exposure to 3 scenarios and rehearsal	Newly designed 18 item injection phobia scale, included subscales for anxiety and for avoidance	Mean injection phobia anxiety sub-scale measures were 43.8 for 1 session and 48.3 for 5 sessions at baseline, 22.7 and 17.1 at post-treatment, 16.2 and 15.2 at follow-up respectively Mean injection phobia avoidance sub-scale measures were 22.8 for 1 session and 24.6 for 5 sessions at baseline, 11.4 and 9.2 at post-treatment, 7.2 and 7.5 at follow-up respectively. Significant difference between two groups evident only at post-treatment ($p < .001$)
Coldwell et al. (1998) USA Subgroup for larger study investigating effect of alprazolam on exposure therapy	Recruitment and screening methods not stated $N = 9$, age range 18–49 years, 6 females 6/9 cases met criteria for specific phobia (DSM IV), all had dental injection fear	Computer assisted relaxation learning (CARL), computerized exposure-based therapy, weekly for 2–5 weeks Includes relaxation and exposure hierarchy, *in vitro* (video-taped exposure, up to 30 minutes) and *in vivo* (repeat scripted activities seen in the video with dental hygienist, until receives injection or all scripts completed)	Ability to receive two dental injections University of Washington Dental Fears Research Clinic Needle Survey (5 item)	All nine cases able to receive two dental injections Reduction in survey score from mean of 3.8 at baseline to 1.7 at 3 months ($p < .001$), and 1.9 at 12 months follow-up ($p < .002$, compared to baseline)

Table 1. (cont.).

Study	Participants	Intervention	Main outcome measures	Findings
Mohr et al. (2002) USA Observational pilot study	Self-referral 10/20 screened met criteria $N = 8$, All over 18 years, 6 employed All had diagnosis of multiple sclerosis, prescribed weekly intramuscular injections 4/8 met criteria for BII (DSM IV), all had self-injecting anxiety	Self Injection Anxiety therapy (SIAT), manualized 6-week 50-minute sessions of cognitive behavioural treatment with therapist. Includes relaxation, behaviour modification, contingency management and cognitive restructuring	Ability to self-inject at final treatment session and at 3-month follow-up Self-injection anxiety subjective units of distress rating (SUDS)	7/8 able to self-inject at end of 6 weeks, remaining case able to inject after a further week of treatment 7/8 still able to inject at 3 months Significant change in SUDS scores reported between baseline and post-treatment ($p < 0.01$) but not between post-treatment and 3 month follow-up

Mohr, Cox, Epstein and Boudewyn (2002)

This publication described a pilot observational study for eight participants with multiple sclerosis, prescribed weekly injections, who received manualized self-injection anxiety therapy (SIAT). There was no comparison group. Fifty percent met criteria for BII (DSM IV) and all had "self-injection anxiety". Seven participants were able to self-inject at the end of 6 weeks and the eighth case required a further week of therapy. At 3 months, 7/8 cases were still successfully self-injecting. Scores for (10-point likert) self-injection anxiety subjective units of distress rating (SUDS) were not reported but it is claimed that a statistically significant change was identified between baseline and post-treatment ($p < .01$) but not between post-treatment and 3-month follow-up. This pilot study was also subject to selection bias as participants were recruited via an advertising campaign. It is not evident whether the therapists also conducted the assessments and thus subject the data to information bias.

Discussion

Our findings demonstrate a paucity of research in the field, which is somewhat surprising given that many medications are prescribed as injections. Further, the three studies reviewed here greatly differed. Öst et al. (1992) conducted an intervention comparison study, whereas the other two publications detailed small observational studies without a comparison group. Participant recruitment and selection also varied, and selection bias is a concern for all three studies. It is worth noting that, as these individuals rarely seek treatment for their injection fear or phobia, self-referral following advertising may be a necessary limitation. In the two smaller studies, not all participants met standardized criteria for phobia. All three studies used interventions based on cognitive-behavioural techniques but included different components. However, each did include a component of cognitive restructuring and of exposure to the feared object through a traditional graded hierarchy either *in vitro* or *in vivo*. In all three studies, different outcome measures and duration of follow-up were used. Development and consensus on these measures is required and therefore it is not currently appropriate to combine the outcomes of these studies. That said, all three studies had favourable findings and the two treatments used by Öst et al. (1992) have considerable face validity and both are certainly worthy of further investigation, possibly with an appropriate placebo comparison group. In the other two studies, only small sample sizes were used and with no comparison group. More worryingly, however, some participants in the study by Coldwell et al. (1998) would have received alprazolam and thus, it is impossible to say which was the true active component of treatment. In essence, the evidence for the effectiveness of these treatments is less than ideal and further research is required to confirm these optimistic findings and to adequately assess the treatment effect size.

For patients with chronic illnesses requiring maintenance injectable medication, the generalizability of these studies is somewhat poor but it should be remembered that this was not the aim of the original studies. In the studies reviewed here, two explicitly excluded cases with psychopathology, many participants were employed, and some were required to self-inject. The question of how to treat injection fear and phobia in such patients therefore remains unanswered. Limitations of this systematic review include limited hand-searching of journals and selection bias remains a possibility, despite two researchers separately reviewing the publications yielded by the electronic searches.

Declaration of Interest

MXP has received consultation fees from the pharmaceutical industry and has previously worked on two clinical drug trials for Janssen-Cilag.

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