

Psychological interventions for needle-related procedural pain and distress in children and adolescents

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For the current issue of the *Journal*, we asked Drs Anna Taddio and C Meghan McMurtry to comment on and put into context the Cochrane Review on psychological interventions for needle-related procedural pain and distress in children and adolescents (1).

Background

This review is an updated version of the original Cochrane review published in Issue 4, 2006. Needle-related procedures are a common source of pain and distress for children. Our previous review on this topic indicated that several psychological interventions were efficacious in managing paediatric needle pain including distraction, hypnosis and combined cognitive behavioural interventions. Considerable additional research in the area has been published since that time.

Methods

Search strategy: Searches of the following databases were conducted for relevant randomized controlled trials (RCTs): Cochrane Central Register of Controlled Trials (CENTRAL); MEDLINE; EMBASE; PsycINFO; the Cumulative Index to Nursing and Allied Health Literature (CINAHL); and Web of Science. Requests for relevant studies were also posted on various electronic list servers. An updated search was conducted in March 2012 and again in March 2013.

Selection criteria: Participants included children and adolescents two to 19 years of age undergoing needle-related procedures. Only RCTs with ≥ 5 participants in each study arm comparing a psychological intervention group with a control or comparison group were eligible for inclusion.

Data analysis: Two review authors extracted data and assessed trial quality, and a third author helped with data extraction and coding for one non-English study. Included studies were coded for quality using the Cochrane Risk of bias tool. Standardized mean differences with 95% CIs were calculated for all analyses using Review Manager version 5.2.

Results

Thirty-nine trials with a total of 3394 participants were included. The most commonly studied needle-related procedures were venipuncture, intravenous line insertion and immunization. Studies included children two to 19 years of age, with the most evidence available for children < 12 years of age. Consistent with the original review, the most commonly studied psychological interventions for needle procedures were distraction, hypnosis and cognitive behavioural therapy (CBT). The majority of included studies (19 of 39) examined distraction only. The additional studies from this review update continued to provide strong evidence for the efficacy of

distraction and hypnosis. No evidence was available to support the efficacy of preparation and information, combined CBT (≥ 2 cognitive or behavioural strategies combined), parent coaching plus distraction, suggestion or virtual reality for reducing children's pain and distress. No conclusions could be drawn about interventions of memory alteration, parent positioning plus distraction, blowing out air or distraction plus suggestion because evidence was available from single studies only. In addition, the risk of bias scores indicated several domains with high or unclear bias scores (eg, selection, detection and performance bias), suggesting that the methodological rigour and reporting of RCTs of psychological interventions continue to exhibit considerable room for improvement.

Conclusions

Overall, there is strong evidence supporting the efficacy of distraction and hypnosis for needle-related pain and distress in children and adolescents, with no evidence currently available for preparation and information or both, combined CBT, parent coaching plus distraction, suggestion or virtual reality. Additional research is needed to further assess interventions that have only been investigated in one RCT to date (ie, memory alteration, parent positioning plus distraction, blowing out air and distraction plus suggestion). There are continuing issues with the quality of trials examining psychological interventions for needle-related pain and distress.

The full text of the Cochrane Review is available in The Cochrane Library (1).

EXPERT COMMENTARY

Children undergo a variety of needle procedures as part of routine medical care including vaccine injections, venipunctures and venous cannulations. Pain and distress are highly salient features of such procedures. Until recently, very little attention was devoted to pain management during needle procedures due to beliefs that there were no adverse consequences; furthermore, the concept of fear was not well integrated into this literature, although fear is a significant component of the pain experience. Accumulating research clearly demonstrates that needle-related procedures are among children's most feared experiences, and negative experiences with such procedures can have a lifelong impact. Specifically, children can become afraid of needles, health care professionals and related appointments; parents and children can also refuse future medical and dental procedures, negatively impacting children's health outcomes. Finding ways to mitigate pain and distress is, therefore, currently regarded as highly clinically relevant and integral to the delivery of quality, patient-/family-centred health care.

The systematic review by Uman et al (1) is an important contribution to this therapeutic area because it used a methodologically rigorous approach to evaluate the effectiveness of one of the

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four main types of pain management – psychological interventions (ie, thoughts and behaviours). The other three types were not discussed and include procedural (ie, injection techniques), physical (ie, body position and activity) and pharmacological interventions (ie, pain medicine). Together, these are referred to as the ‘4 Ps’ of pain management (2). Thirty-nine trials met the inclusion criteria, involving multiple types of needle procedures and a wide age range, thus revealing a relatively small and heterogeneous evidence base. Distraction and hypnosis were identified as two options for which there was sufficient evidence of benefit. The typical clinician, however, is not trained in hypnosis, leaving distraction as the sole feasible option for clinical implementation. The review did not separate the results according to different modes of distraction, and further questions were raised about the optimal type of distractor and role of caregivers. A subsequent systematic review by the same team elegantly examined these issues more closely and found no differences between distractor subtypes (ie, high versus low tech, active versus passive, parent involvement versus no involvement, and child choice versus no choice) (3). Given these results, clinicians are required to use their own judgment when determining which techniques to use in individual children and settings. Some specific options for distraction include bubble blowing, listening to music and watching a video. In many instances, children and their parent’s own electronic devices can be used. It is important to note that no single intervention from any domain of the 4 Ps has been demonstrated to reliably eliminate pain. Combining

interventions from the different domains improves overall pain relief and is, therefore, strongly recommended (4).

Beyond the scope of both reviews was the approach to take in children with needle phobia (5% to 10% prevalence), whereby there is a high degree of needle fear involving avoidance of needle procedures, substantial distress if forced to undergo a procedure and/or impairment from the fear. Inquiring about children’s history with medical procedures and level of fear is important to guide care. For instance, nonurgent needle procedures, such as routine immunizations, may be better postponed until the needle fear itself has been treated to avoid escalating the fear. For example, if the child has to be held down by multiple individuals to be immunized, this will result in extreme distress and reinforce future avoidance behaviour. Urgent needle procedures (eg, emergency department venipunctures), on the other hand, may need to be managed with pharmacological intervention such as inhalational nitrous oxide or intranasal anxiolytics in the child with needle phobia. Expertise is required in the use of these medications. Exposure-based therapy sessions are recommended with qualified health professionals (eg, psychologists) to overcome needle phobia in afflicted individuals. Following successful therapy for needle fear, individuals can undergo needle procedures with the same pain treatments as individuals without needle fear. The authors of this commentary are currently updating a clinical practice guideline for vaccine injections (4) that will encompass evidence-based pain management as well as the treatment of needle fear across the lifespan to help address the current care gap.

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