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Reducing children's fear when undergoing painful procedures

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INTRODUCTION

Many children present to A&E departments with injuries or illnesses requiring brief but often moderately painful procedures such as suturing or replacement of fingernails following crush injuries to finger tips. Pain control is often dependent on the doctor and procedure planned, but fear often causes the child to become uncooperative and treatment is made difficult despite the analgesia. Reduction of this fear facilitates treatment and increases co-operation. We describe a trial of oral Midazolam, a short acting benzodiazepine, and document its effectiveness in anxiolysis.

MATERIALS AND METHODS

A double blind randomized trial was conducted with approval from the hospital ethical committee. All children aged 6 months to 6 years were eligible if they were to have painful procedures performed. These painful procedures included wound repairs, finger tip injuries for dressing, subungual haematoma trephining, dressing of burns, nasal packing for epistaxis and application of traction for femoral fractures. Informed consent was obtained from parents in every case, and a dose of $0.2\,mg\,kg^{-1}$ randomized blind liquid (midazolam in syrup or syrup placebo) administered. Analgesia was provided with paracetamol suspension (Calpol) at the dose of 120 mg for children aged 6 months–1 year and 250 mg for those aged over 1 year. Anxiety levels were measured prior to administration by a previously described anxiety scale (Appendix 1), then checked and validated internally within the hospital by colleagues. Anxiety levels were again measured during or immediately after the procedures. Blood pressure, when feasible, pulse rate and respiratory rate

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were noted before and during the procedures. Any complications or untoward events were to be noted according to the protocol.

RESULTS

Seventeen patients received placebo and 16 patients received an active drug before the trial was brought to a premature conclusion. The two groups were not significantly different in ages, weights, or dosages given (Table 1).

The mean anxiety levels of the two groups prior to procedure are shown in Table 2, and are not significantly different. Table 3 shows the number of patients in each group who improved their scores (became less anxious), remained the same or became worse.

There was a decrease in pulse rate following the procedures (Table 4), and a decrease in respiratory rate. These differences were not statistically significant,

Table 1. Age and weight of patients.

	Group A (Midazolam)	Group B (Placebo)
	mean (range)	mean (range)
age (years)	2.9 (1.0–6.8)	2.8 (0.6–6.8)
weight (Kg)	15.76 (9.5–24.5)	14.68 (8.5–24.5)

Table 2. Anxiety levels before medication.

Anxiety level	Group A (Midazolam)	Group B (Placebo)
1	2	4
2	2	2
3	11	7
4	3	4

Table 3. Anxiety levels after medication.

	Group A (Midazolam)	Group B (Placebo)
Improved	10	3
Same	3	7
Worse	3	7

$X^2 = 6.94,\ 0.05 > P > 0.02$

Table 4. Changes in heart and respiratory rates after medication.

	Group A (Midazolam)	Group B (Placebo)
	mean (range)	mean (range)
Heart rate drop	18.5 (−12−+40)	−0.8 (−20−+16)
Resp rate drop	1.2 (−12−+10)	0.7 (−10−+8)

and the decrease in respiratory rate was not dramatic in any patient and caused no clinical problems.

The trial was stopped when the nurses complained that they could tell which was the active drug and which was the placebo (the latter by its lack of effect compared to the former). Interim analysis (after breaking the code) was performed which confirmed their clinical findings, and it was decided that it was unethical to continue giving children the placebo.

DISCUSSION

A busy A&E department is a frightening place for a child, especially after he or she has already suffered a painful injury. The fear of treatment may increase the problem. Any medication that will help reduce this anxiety may increase cooperation and allow better treatment.

Sedatives, such as Trimeprazine have been used but their effect has been limited (Sponheim *et al.*, 1990). Furthermore, it is not sedation but anxiolysis that is the aim. Hypnosis has been used, but is difficult and time consuming (Zelter & Lebarn, 1982).

Midazolam is a potent water-soluble imidazobenzodiazepine with anxiolytic, muscle-relaxant and anticonvulsant activity. At sedative and anaesthetic doses, the action is rapid in onset and of short duration with anterograde amnesia accompanying the period of peak sedation. Oral midazolam in a syrup for paediatric use is not yet available commercially, but effective blood levels have been demonstrated (Payne *et al.*, 1990). Its clinical value in reducing anxiety of pre-school children during wound repair has been reported (Hennes *et al.*, 1990). Side-effects include respiratory depression and decreased cardiac output. Flumazenil, a new benzodiazepine antagonist, has been shown to be effective in reversing these central sedative effects of Midazolam (Rosenbaum & Hooper, 1988).

We have demonstrated a decrease in anxiety with Midazolam. Respiratory depression did not occur and there were no other side-effects. We conclude that Midazolam by mouth provides a high level of reduction of anxiety for children undergoing painful procedures in A&E departments, and should become common practice where this effect is felt desirable. This should improve patient cooperation, and will also reduce anxiety levels in the attending parent, the nursing staff and possibly the medical attendant performing the procedure.

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APPENDIX 1

Anxiety level scale.

SCORE	Child behaviour before the procedure	Child behaviour during the procedure
1	Cooperative during examination	Intermittent crying*
2	Crying only when wound is touched	Continuous crying**
3	Crying during general examination	Uncontrolled crying**
4	Uncontrolled crying	

* Required no additional restraint by assistant.
** Required additional restraint by assistant.