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REDUCING THE PAIN OF BLOOD DONATION: TRIAL OF A PAIN NUMBING DEVICE IN A BLOOD DONATION SETTING

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INTRODUCTION

A fear of needles is a commonly cited deterrent to blood donation[1], but many people overcome this and turn up to donate blood. Of concern, donors who report a fear of injections and blood draws are more likely to experience vasovagal symptoms such as faintness, or dizziness.[2]

An important component of fear of needles is concern about pain associated with needle insertion.[3] Recently published research indicated that nearly half of all donors (48%) who had made at least 1 prior donation reported having a moderate fear of feeling pain.[4]

A potential solution is a pain numbing device called 'CoolSense®'. CoolSense® is a non-invasive hand held device that works by numbing the phlebotomy site prior to a needle insertion. It has been used in other potentially painful procedures, including immunisations, botulinum toxin injections, dialysis and glucose monitoring in diabetic patients.

The aim of this study was to assess the feasibility of using the CoolSense® device in the blood collection setting, and determine a suitable application time.

METHODS & MATERIALS

A feasible trial was conducted at a Victorian donor centre. Six staff members were trained in the use of the CoolSense® device (Fig 1).

CoolSense was applied to the phlebotomy site (Cubital fossa) after the site was disinfected. Once the device was removed the needle was inserted and the blood donation continued as per normal procedure.

Forty-nine whole blood donors were recruited to this study. Donors were excluded if they:

- Had donated fewer than 3 times previously;
- Experienced an adverse reaction on their last donation;
- Reported a known sensitivity to Isopropyl alcohol or topical disinfectants and
- Reported a known sensitivity to cold temperatures i.e. Reynaud's disease.

Participants were allocated to the following groups, to test the relative impact of different application times:

- Group 1, up to 10 seconds (n=15)
- Group 2, up to 20 seconds (n=18)
- Group 3, up to 30 seconds (n=16)

Donors completed a pre and post donation questionnaire that assessed their levels of anxiety (STAI 6-item[5]), anticipated and actual levels of pain, and their perspectives of using the device.

Wilcoxon signed rank tests were conducted to determine differences between pre and post levels of anxiety (Table 1) and pre and post levels of pain (Table 2).

RESULTS

The donor cohort had a mean age of 41.9 years (SD±17.9, range 18-74), with similar numbers of males and females (53%). The sample largely comprised of experienced donors with a mean of 20 prior donations (SD±29, range 3-114).

Anxiety scores significantly reduced among all 3 groups. Differences in pain scores across the three groups were also assessed. Pain ratings (post-donation) were significantly lower than anticipated pain (pre-donation) for Group 2 and Group 3.

Feedback from donors involved in the trial reflected these findings with donors in the 10 second group generally reporting no difference in the pain they anticipated compared with the actual pain experienced. However, donors in the 20-second and 30-second application group reported experiencing a notable reduction in pain than they had anticipated, based on previous :

'The needle insertion was definitely less noticeable with use of CoolSense® today when compared to past donations.'

'Good experience. No pain when needle was inserted.'

'Soothing, painless, effective in removing initial piercing pain.'

Staff indicated the device was easy to use, reporting a median score of 4 for how confident they were in using the device (1=Not at all–to-5=Extremely confident).

"It's very easy to use, the only challenging thing about it is having to time how long it has been on the skin. Everything else is easy!"

Table 1. Differences between pre and post donation anxiety (Range 20-80); Median (IQR).

	Pre- donation Anxiety	Post-donation Anxiety	p
Group 1	26.7 (20.0-33.3)	20.0 (20.0-26.7)	0.001
Group 2	26.7 (20.8-32.5)	26.7 (20.0-31.7)	<0.0001
Group 3	25.0 (23.3-32.5)	20.0 (20.0-29.2)	<0.0001
Overall	26.7(20.0-33.3)	20.0 (20.0-30.0)	<0.0001

Table 2. Differences between anticipated and actual pain (Range:1-7); Median (IQR)

	Anticipated Pain	Actual Pain	p
Group 1	3 (1-4)	2(1-4)	0.55
Group 2	3 (2.8-4.3)	2 (1.8-3.3)	0.03
Group 3	3 (2-3.8)	2 (1-3)	0.005
Overall	3 (2-4)	2 (1-3)	0.001

Figure 1. CoolSense® device

CONCLUSIONS

Use of the Coolsense® device for greater than 10 seconds may be effective in reducing needle pain and anxiety during phlebotomy. Findings from this study are being used to develop a larger randomised controlled trial to determine the efficacy of the device across different donor populations and the impact it has on donor retention.

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Australian Red Cross BLOOD SERVICE

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