

Effectiveness of ICE Application v/s Manual Pressure at LI4 Prior to Intramuscular Injection in Reduction of Pain among Children (15-18 Months) in Selected Immunization Clinics at Mangalore

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Abstract: *Atraumatic care is one of the important trend in pediatric nursing. Evaluative quasi experimental post test only control group design was used. Purposive sampling technique was used to select 90 sample. The data was obtained by baseline proforma and FLACC scale. The study showed that majority of children receiving manual pressure showed mild behavioural response (83.3%) to pain, ice application showed moderate response (73.3%) and routine care showed severe response (96.7%) to pain. The study found that there is significant difference between the behavioural response to pain among children with manual pressure at LI4 area ($t_{58}=27.31$) and ice application ($t_{58}=13.13$). The study concluded that manual pressure is effective than ice application. Study also found that there is significant association between the educational status of mothers, reaction of children towards health personnel in experimental group I and child's past experience to injection in control group and in experimental group I with behavioural response to pain at $p < 0.05$ level of significance.*

Keywords: Ice application; Manual pressure; Intramuscular injection; Pain

1. Introduction or Background

Today the word "injection" not only brings a sense of fear among children but also among adults. Pain is a universal, complex and subjective experience.¹ The most common pain measures used for infants are behavioural.² Intramuscular injection has also been associated with display of some behavioural responses like crying, kicking, squirming, etc. So nurses can use simple interventions like acupressure to relieve procedural pain in children and promote comfort for them.

The provision of ice application and manual pressure at acupressure point (LI4 area) prior to intramuscular injection is one of the simple and effective methods of reducing pain during intramuscular injection. However, this approach is mainly used alternative system of medicine "acupressure" in reducing pain during intramuscular injection among children.

World population continues to grow, but the number of children in the world has now reached its peak. According to the United Nation's population division estimate for the mid 2010, there were 642 million children aged 0- 4 years.³ There are 12 billion intramuscular injections administered annually throughout the world.

Providing pain relief is considered as a most basic human right, so it is the responsibility of the nurse to use the most effective approach to pain control. Nurses are ethically and legally responsible for managing pain and to relieve suffering. Effective pain management not only reduces physical discomfort, but also improves quality of

life.⁴ According to many research reports acupressure may be regarded as a viable nursing intervention.⁵

2. Materials and Methods

Research Approach: Evaluative research approach

Research design: quasi experimental post-test only control group design

Population: children between 15-18 months fulfilling the inclusion criteria.

Sample size: 90 Sample and 30 sample in each group

Sampling technique: Purposive sampling technique and randomly assigned to experimental group I, Experimental group II and control group

Inclusion criteria:

In this study it refers to children: in the age group of 15-18 months. visited for immunization at immunization clinics of hospital and PHC receiving Intramuscular injections.

Data collection tools: Baseline proforma and FLACC scale

Validity of tool: Content and Construct validity of the FLACC scale tested.

Reliability of tool :-two-way cross tabulations and kappa statistics were used to determine inter-rater reliability, ($r_{87}=0.94$; $p \leq 0.001$), demonstrating good inter-rater reliability. (Sandy Merkel MS-RN-BC;1997)

Intervention:- Manual pressure given at LI4 area with investigators thumb for 30 seconds 5 minutes prior to intramuscular injection to Experimental group I. Ice cube covered with gauze and applied 30 seconds at LI4 area 5 minutes prior to intramuscular injection to Experimental group II.

Analysis:- Mean standard deviation is used as descriptive statistics independent t test used for the comparison and association with demographic variables identified using χ^2 test.

Routine care given to control group. Behavioural response to pain among children (15- 18 months) receiving intramuscular injection measured using FLACC scale.

3. Results

Table 1: Frequency and Percentage Distribution of Sample According to Demographic Characteristics
 $N_1=30, N_2=30, N_3=30$

Demographic variables		Experimental Group I		Experimental Group II		Control group	
		F	%	f	%	F	%
1.	Age(months)						
a.	15-16	9	30.0	7	23.3	12	40.0
b.	16-17	11	36.7	7	23.3	8	26.7
c.	17-80	10	33.3	16	53.3	10	33.3
2.	Gender						
a.	Male	11	36.7	14	46.7	12	40.0
b.	Female	19	63.3	16	53.3	18	60.0
3.	Religion						
a.	Hindu	13	43.3	6	20.0	18	60.0
b.	Christian	5	16.7	9	30.0	7	23.3
c.	Muslim	11	36.7	13	43.3	5	16.7
d.	Others	1	3.3	2	6.7	0	0
4.	Education of father						
a.	Illiterate	2	6.7	1	3.3	2	6.7
b.	Primary	7	23.3	3	10.0	6	20.0
c.	Secondary	8	26.7	15	50.0	11	36.7
d.	Graduate	9	30.0	8	26.7	6	20.0
e.	Post graduate	4	13.3	3	10.0	5	16.7
5.	Education of mother						
a.	Illiterate	2	6.7	0	0.0	2	6.7
b.	Primary	2	6.7	4	13.3	2	6.7
c.	Secondary	12	40.0	13	43.3	17	56.7
d.	Graduate	11	36.7	9	30.0	6	20.0
e.	Post graduate	3	10.0	4	13.3	3	10.0
6.	Annual income(rupees)						
a.	<10,000	0	0.0	2	6.7	2	6.7
b.	10,000-50,000	5	16.7	3	10.0	5	16.7
c.	50,000-1 lakh	10	33.3	5	16.7	9	30.0
d.	>1 lakh	15	50.0	20	66.7	14	46.7
7.	Child's past experience to injection						
a.	Calm and quiet	9	30.0	9	30.0	4	13.3
b.	Minimal resistance	16	53.3	14	46.7	14	46.7
c.	Rebellious & highly resistant	5	16.7	7	23.3	12	40.0
8.	Child's reaction towards health personnel						
a.	Accept early	8	26.7	8	26.7	6	22.0
b.	Withdrawal with minimal resistance	17	56.7	16	53.3	11	44.0
c.	Totally reluctant	5	16.7	6	20.0	13	43.3
9.	Relationship with caregiver						
a.	Father	5	16.7	2	6.7	5	16.7
b.	Mother	15	50.0	15	50.0	12	40.0
c.	Grandparents	6	20.0	9	30.0	9	30.0
d.	Others	4	13.3	4	13.3	4	13.3

Post-test Behaviour Response to Pain among Children (15-18 months) in the Experimental Group I, II and Control Group

The study found that majority (83.3%) of the children in the Experimental Group I experiences mild behavioural responses to pain. Majority of children (73.3%) in

Experimental Group II had moderate behavioural response to pain. In the control group majority (96.7%) of the subjects had severe behavioural responses to pain.

Comparison of behavioural response to pain of the Experimental Group I, II and Control Group (Group III)

The study found that there is a significant difference in the behavioural response to pain among children in

Experimental Group I and Control Group ,Experimental Group II and Control Group and Experimental Group I and Experimental Group II, $t_{(58)} = 1.671$ at $p < 0.001$ level of significance.

Table 2: Association between Behavioural Response to Pain of Experimental Group I, Experimental Group II and Control Group (Group III) with Selected Demographic Variables.

$N_1 = 30, N_2 = 30, N_3 = 30$

Sl. Demographic No. variables	Experimental Group I			Experimental Group II			Control Group		
	χ^2	df	p value	χ^2	df	p .value	χ^2	df	p value
1. Age (months)	4.150	4	0.386 [#]	1.418	4	0.841 [#]	2.845	2	0.241 [#]
2. Gender	4.163	2	0.125 [#]	4.163	2	0.125 [#]	1.552	1	0.213 [#]
3. Religion	3.113	6	0.794 [#]	3.113	6	0.794 [#]	3.399	2	0.183 [#]
4. Education of father	8.443	8	0.391 [#]	2.643	8	0.955 [#]	4.138	4	0.388 [#]
5. Education of mother	15.716	8	0.047 [*]	4.458	6	0.615 [#]	9.310	4	0.054 [#]
6. Annual income (in rupees)	6.520	4	0.164 [#]	1.562	6	0.955 [#]	1.182	3	0.757 [#]
7. Child's past experience to injection	11.417	4	0.022 [*]	4.185	4	0.386 [#]	6.724	2	0.035 [*]
8. Child's reaction towards health personnel	13.235	4	0.010 [*]	2.926	4	0.57 [#]	4.138	2	0.126 [#]
9. Relationship of child with caregiver	1.910	6	0.928 [#]	4.212	6	0.648 [#]	2.414	3	0.491 [#]

* Significant; # Not significant

4. Discussion/ Conclusion

On contrary to the present study findings, the study conducted in Andhra Pradesh to assess the effectiveness of ice application at LI4 area prior to intramuscular injection in reducing pain showed that majority (80%) of the children in the experimental group had mild pain and 93% of subjects in control group had severe pain. The study concluded that ice application is effective in reducing behavioural response to pain during injection among children.¹

A similar study conducted in Mangalore to assess the effect of manual pressure on reducing pain among infants receiving intramuscular immunisation showed that majority (86%) of infants in experimental group showed moderate behavioural response to pain and majority (73%) showed severe behavioural response to pain. The study concluded that manual pressure is simple, non-invasive and effective measure in reducing behavioural response to pain among infants.⁶

A similar study conducted in Urmia to assess the effect of manual pressure on intramuscular injection pain severity showed that the mean between the control group and Experimental Group I were $(5.47 \pm 1.18$ v/s 3.5 ± 0.96 , $p < 0.05$) level of significance. The study concluded that manual pressure is effective in reducing behavioural response to pain during injection.⁷

A similar study conducted in Mangalore to assess the effectiveness of ice application at LI4 area in reducing pain among children during intramuscular injections. The effectiveness of ice application was assessed by 't' test and calculated 't' value 16.89 ($t_{58} = 1.67$) this showed that there was a high statistical significant difference in the level of pain at $p < 0.05$ level between the experimental and control group of children.⁸

In Experimental Group I the mean behavioural response scores were lower than Experimental Group II (4.13 ± 1.33 v/s 1.23 ± 0.85) indicated that there is a significant difference in behavioural response to pain ($t_{58} = 10.02$) at $p < 0.001$ level

of significance. Study concluded that manual pressure is more effective than ice application.

In the present study there is an association between the behavioural response to pain among children in Experimental Group I with education of mother, child's past experience to injection and reaction of children towards health personnel ($\chi^2 = 15.716, 11.42, 13.235$) at $p < 0.05$ level of significance.

There is association between behavioural response to pain among children in control group with child's past experience to injection ($\chi^2 = 6.724$) at $p < 0.05$ level of significance.

The study concluded that there is significant difference between behavioural response to pain with ice application and manual pressure at LI4 area but manual pressure is more effective than ice application.

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