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Therapeutic Hydrostatic Nasolacrimal Massage Vs. Routine Hospital Massage: Effect on Infants with Congenital Nasolacrimal Duct Obstruction

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Abstract: *Congenital obstruction of the nasolacrimal duct (CONLD) is a condition frequently occurs among young infants. Proper early management is urgently required.*

Aim*: the study was carried out to assess the effect of therapeutic hydrostatic nasolacrimal massage on infants with congenital nasolacrimal duct obstruction. .*

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Setting: *The study was conducted at Elramid hospital in Shebin El-kom town- Menoufia governorate.*

Design: *Quasi -experimental research design was utilized.*

Sample: *All infants who suffer from congenital nasolacrimal duct obstruction and meet the criteria for sample selection were included and they consisted of 60 infants.*

Tools: *Three tools were utilized*

Tool one: *Care givers' knowledge structured questionnaire. It consisted of two parts:*

Part 1: *Socio-demographic structured questionnaire.*

Part 2: *Possible risk factors structured questionnaire of developing congenital nasolacrimal duct obstruction:*

Tool two:- *Likert scale nasolacrimal duct obstruction signs and symptom follow up assessment questionnaire.*

Tool three: *Glasgow Benefits therapeutic nasolacrimal massage Inventory: It was consisted of 6 questions.The scoring system was based on a 5-points Likert scale checklist as follows; (1) Much Worse, (2) A little or somewhat worse, (3) No change, (4) A little or somewhat better and (5) Much better.*

Results: *there was highly significant improvement in signs and symptom of therapeutic hydrostatic nasolacrimal massage group after three and six months. There was significant resolution in 60% of nasolacrimal obstruction for hydrostatic massage group. Also, Caregivers of infants who received therapeutic hydrostatic nasolacrimal massage reported marked improvements in their physical condition than who received routine hospital message.*

Conclusion: *Infants with congenital nasolacrimal duct obstruction who received therapeutic hydrostatic nasolacrimal massage had marked improvements in their clinical signs and symptoms than infants who received routine hospital massage. Also, the majority (60%) of Infants who received therapeutic hydrostatic nasolacrimal massage had experienced complete resolution of their nasolacrimal duct obstruction within 6 months*

Recommendations: *Therapeutic hydrostatic nasolacrimal massage should be utilized for all infants who suffer from nasolacrimal duct obstruction. Also, training programs regarding therapeutic hydrostatic nasolacrimal massage should be designed for pediatric nurses and infants' caregivers.*

Keywords: *Congenital Nasolacrimal Duct Obstruction, Hydrostatic Nasolacrimal Massage, Routine hospital Massage*

I. Introduction

Obstruction of the lacrimal system can occur at any age but it is a particular common pediatric problem. It is one of the most common ocular conditions of infancy [1]. It was found in up to 30 % of infants at birth and 2 - 4 % has symptoms of nasolacrimal duct obstruction affecting one or both eyes. The most common cause of this critical problem is the failure of a canalization of the duct at its mucosal entrance (valve of hasner) into the inferior meatus of the nose [2]. Blockage of the drainage system causes excessive tears on the surface of the eye and overflow onto the eyelashes, eyelids, and down the cheek. This usually occurs within the first weeks of life. The eyelids can become red and swollen with yellowish-green discharge. When normal eyelid bacteria are not properly "flushed" down the obstructed system severe serious infection of the tear duct system (dacryocystitis) will occur [3].

The severity of the signs can vary under different conditions. If a child has cold, he may have increased tearing or discharge [4]. Tears normally drain through small openings in the corners of the upper and lower eyelids called puncta and enter the nose through the nasolacrimal duct. Tear duct obstruction prevents

tears from draining through this system normally. If the tear duct is blocked, there will be backflow of tears and discharge from the eye [5].

Fortunately, approximately 90% clear spontaneously during the first year of life. When obstruction is persistent, one or more of the following treatments may be recommended: tear duct massage, topical antibiotic eye drops, tear duct probing, balloon tear duct dilation, and/or tear duct intubation. Surgical procedure is usually accompanied with risk hazards especially during the first year of life. Tear duct massage is considered as a natural simple technique for care givers and can be performed at home to help the tear duct open. A pediatric ophthalmologist or primary care nurses can demonstrate it to help infants gain its benefits [6].

It was estimated in previous advanced researches that, hydrostatic lacrimal sac massage was more effective than gentle lacrimal massage or no massage [7]. Also it was observed that the technique of massage generally advised to parents did not result in opening up of the duct, with persistent epiphora and a high rate of probing subsequently [8]. It was related to, most parents were found to massage either at the wrong place (over the nasal bone), or too gently, or in the wrong direction (up and down) [9]. This encouraged us to conduct the present study to compare the results of different techniques of nasolacrimal massage for infants with nasolacrimal duct obstruction.

1.1 Aim of the study:

This study was carried out to assess the effect of therapeutic hydrostatic nasolacrimal massage on infants with congenital nasolacrimal duct obstruction.

1.2 Research hypotheses:

1- Infants with congenital nasolacrimal duct obstruction who received therapeutic hydrostatic nasolacrimal massage will have lower signs and symptoms than infants who received routine message.

2- Infants with congenital nasolacrimal duct obstruction who received therapeutic hydrostatic nasolacrimal massage will experience resolution of their nasolacrimal obstruction within 6 months.

II. Methods

2.1. Research design:

Quasi -experimental research design was utilized

2.2. Setting:

The study was conducted at Elramid hospital in Shebin El-kom town- Menoufia governorate.

2.3. Sample:

All infants who suffer from congenital nasolacrimal duct obstruction and meet the criteria for sample selection were included and they consisted of 60 infants. A simple random sample was done to assign infants equally into experimental group (received therapeutic hydrostatic nasolacrimal massage) and control group (received routine hospital nasolacrimal massage).

Inclusion criteria:

1-Infants who suffer from congenital nasolacrimal duct obstruction

2-Age less than one year

3-Did not receive any surgical interference concerning nasolacrimal obstruction

2.4. Tools:

Three tools were developed by the researchers based on review of related literature. ***Tool one:*** Care givers' knowledge structured questionnaire. It consisted of two parts: Part 1: Socio-demographic structured questionnaire: it includes child name, age, laterality and previous treatment. Part 2: Possible risk factors structured questionnaire of developing congenital nasolacrimal duct obstruction: ***Tool two*:-**Likert scale nasolacrimal duct obstruction signs and symptom follow up assessment questionnaire. ***Tool three*:** Glasgow Benefits therapeutic nasolacrimal massage Inventory. It is an assessment questionnaire from care givers' perspectives. It was utilized to assess benefits and improvement in infants' physical condition. It was consisted of six questions. The scoring system was based on 5-point Likert scale checklist as follows; (1) Much Worse, (2) A little or somewhat worse, (3) No change, (4) A little or somewhat better and (5) Much better .

Likert scale nasolacrimal duct obstruction signs and symptom follow up assessment questionnaire

Scoring system.

Items	Score
Not present	1
Mild	2
Moderate	3
Severe	4

Glasgow Benefits therapeutic nasolacrimal massage Inventory Scoring system.

Items	Score
Much Worse	**1**
A little or somewhat worse	**2**
No change	**3**
A little or somewhat better	**4**
Much better	**5**

2.4.1 Reliability of the tools:
"The internal consistency of the questionnaires was calculated using Cronbach's alpha coefficients. Test-retest was used. The Cronbach's alpha of the questionnaire was 0.92 indicate good reliability".

2.4.2 Validity of the tools:
The tools were tested for content validity by jury of five experts in the field of Pediatric nursing and pediatrics to ascertain relevance and completeness.

III. Data Collection Methods

- Data was collected at the first of February 2015 to the end of July 2015**.**

Approval:

- **An official letters** was sent to the Dean of the faculty of Nursing, Menoufia University and to the directors of the selected hospital with an explanation of the aim of the study to get their permission**.**
- **Ethical consideration:** The study was conducted with careful attention to ethical standards of research and rights of participants. An oral and written consent were obtained from infants' care givers to participate in the study. During the initial interview the purpose and importance of the study was explained. The subjects were assured that all information would be confidential and their participation in the study was voluntary without any costs

3.2. Procedure of data collection:

- **At the beginning** the researcher takes the required permission to conduct the study and assign the participants.
- ***Tool development:*** tools were developed by the researcher after reviewing the related literature to collect the necessary data. All tools were tested for clarity and relevance by a panel of five experts in pediatric nursing field and validity was ensured. Accordingly, the necessary adjustments were carried out.
- **Pilot Study*:*** It was conducted on 10% of the infants and their caregiver to assess the clarity, applicability and time necessary to fill the tools**.** No necessary modifications were done. It was included in the total sample
- Data collection was done in three phases as follows:

3.2. 1. Assessment phase:

Infants who meet the criteria for sample selection were equally classified into two groups. Therapeutic hydrostatic nasolacrimal massage group and the routine hospital nasolacrimal massage group. For infants who receive routine hospital nasolacrimal massage their caregivers were informed about utilizing this type of massage according to hospital policy. Also, they asked to follow recommended checkup visits such as infants who receive hydrostatic nasolacrimal massage. Primarily an orientation about the therapeutic hydrostatic nasolacrimal massage, its purpose, benefits and utilization of proper technique was done for the care givers of the hydrostatic therapeutic nasolacrimal massage group.

Caregivers of infants in the two groups were informed about the importance of checkup weekly for the first four visits at the clinic to assure that they utilize the technique properly. Also, they were asked to feel free to ask any question through telephone at any time. An evidence based therapeutic hydrostatic massage booklet was given to the caregivers of the experimental group to follow it as needed. Assessment of infants' signs and symptoms laterality of obstruction was done at the first time for both groups.

3.2.2. Implementation phase:

Implementations of therapeutic hydrostatic nasolacrimal massage technique:

Parents were instructed to place the index finger over the inner canthus of the affected eye and exert gentle pressure inwards over the lacrimal sac in order to express secretions downwards firmly through the nasolacrimal duct to increase hydrostatic pressure. Hydrostatic pressure was applied after placing the thumb over the sac so that the return flow of tears through the punctum was shut off (Figure 3). The edge of the thumb was then pressed downward over the punctum, compressing it against the rim of the orbit and over the sac. The compressed fluid and contents in the lacrimal sac were allowed to transmit the pressure of the contents to the

walls of the sac. Successful resolution of the blockage was shown as no epiphora or discharge. Massage was implemented four times per day (ten times in the morning, ten times in the evening, ten times in the afternoon, and ten times at the night).

Figure (1): illustrate proper site and direction of therapeutic hydrostatic nasolacrimal massage.

Mothers were asked to demonstrate their respective techniques at the time of entry into the study and subsequently at each follow-up visit. Massage was continued till the signs and symptoms of NLD obstruction resolved or the infant reached 6 months from the beginning of the study then final assessment was done.

3.2.3. Follow up phase:

Assessment of correct demonstration of prober therapeutic hydrostatic nasolacrimal massage technique was done for (therapeutic hydrostatic nasolacrimal massage group). Assessment of improvement in infants' clinical signs and symptoms also was done for both groups every week for the first four weeks then every two weeks until completion of six months. After completion of three months, the first post test for both groups was done. The final posttest was conducted after completion of 6 months.

3.3. Statistical analysis

The data collected were tabulated & analyzed by SPSS (Statistical Package for the social Science Software) statistical package version 20 on IBM compatible computer. Quantitative data were expressed as mean & standard deviation (X±SD) and analyzed by applying student t-test for normally distributed variables. Qualitative data were expressed as number and percentage

P-value at 0.05 was used to determine significance regarding

P-value > 0.05 to be statistically insignificant

P-value ≤ 0.05 to be statistically significant

P-value ≤ 0.001 to be high statistically significant

IV. Results

Table (1) shows general characteristics of infants. The majority (60%) of the infant in the experimental group were female. While,70% of infants in the control group were male. More than half of the two groups were less than 6 months. It was observed that most of both group had unilateral congenital nasolacrimal duct obstruction. Also, the majority of experimental and control group (80% and 73.3% respectively) were treated by routine lacrimal massage and topical antibiotics as a previous treatment**.**

Table (2) Clarifies possible risk factors for developing congenital nasolacrimal duct obstruction. This study represented that there were no statistical significant differences between experimental and control groups regarding possible risk factors for congenital nasolacrimal duct obstruction.

Table (3) represents that there was no significant improvement after three and six months regarding epiphora, mucous discharge, itching, burning or redness around the eye and nasal blockage. The majority (60%) of infants had moderate swelling around the eye after 6 months. On the other hand, all subject had no change in visual acuity after 6 months from routine message.

Table (4) reveals that there was significant improvement regarding signs and symptom of congenital nasolacrimal duct obstruction for therapeutic hydrostatic nasolacrimal massage group after three and six months. More than half (60%) of the infants who had therapeutic hydrostatic nasolacrimal massage didn't develop epiphora. They had mild mucus discharge after 6 months. On the other hand, 63.3% hadn't swelling and itching, burning or redness around the eye. Also, they hadn't nasal blockage. In addition, there was significant improvement in their visual acuity after 3 and 6 months (53.3%, 96.7% respectively).

Table (5) shows that there were highly statistical improvement in the total mean score and standard division regarding infant's clinical condition who undergone therapeutic hydrostatic nasolacrimal massage rather than who had routine message.

Table (6) shows that there was no significant differences regarding signs and symptoms of congenital nasolacrimal duct obstruction for routine message and therapeutic hydrostatic nasolacrimal massage on pre starting message . While, it was obvious that there was a significant improvement in the signs and symptoms of congenital nasolacrimal duct obstruction after three and six months in the group who had therapeutic hydrostatic nasolacrimal massage rather than who undergone routine message.

Figure (2) presents that there were highly statistical improvement in total mean score regarding signs and symptoms after three and six months for studied sample who undergone therapeutic hydrostatic nasolacrimal message. On the other hand**,** there were no statistical improvement for studied sample who undergone routine message after three and six months.

Figure (3) clarifies that resolution rate for congenital nasolacrimal duct obstruction in both studied group. More than half (60%) of infants resolved with therapeutic hydrostatic nasolacrimal massage within 6 months compared to 36.70% in infants who applied routine message.

Table (1) Distribution of the infants according to their general characteristics

Items	Experimental Group		Control Group		χ^2	P
	No	%	No	%		
Gender					5.45	<0.05
- Male	12	40.0%	21	70.0%		
-Female	18	60.0%	9	30.0%		
Age of infants					0.28	>0.05
-<6 months	18	60.0%	20	66.7%		
-6-12 months	12	40.0%	10	33.3%		
Laterality of Congenital Nasolacrimal Obstruction					0.37	>0.05
-Unilateral	24	80.0%	21	70.0%		
-Bilateral	6	20.0%	9	30.0%		
Previous treatment					5.36	>0.05
- Routine lacrimal massage & Topical antibiotics	24	80.0%	22	73.3%		
-Routine lacrimal massage only	1	3.3%	0	0.0%		
- Topical antibiotics	2	6.7%	0	0.0%		
- None	3	10.0%	8	26.7%		

Table (2) possible risk factors for developing congenital nasolacrimal duct obstruction

Items	Experimental Group		Control Group		χ^2	P
	No	%	No	%		
Infection during pregnancy					0.12	>0.05
Yes	3	10 %	4	13.3%		
No	27	90 %	26	86.7%		
Mothers was taken medication in the first trimester					1.20	>0.05
Yes	8	26.7%	12	40.0%		
No	22	73.3%	18	60.0%		
X.ray in the first trimester					2.04	>0.05
Yes	17	56.7%	12	40.0%		
No	13	43.3%	18	60.0%		
Other siblings had Congenital Nasolicrimal duct obstruction					1.45	>0.05
Yes	5	16.7%	2	6.7%		
No	25	83.3%	28	93.3%		
Consanguinity					0.85	>0.05
Yes	12	40 %	8	26.7%		
No	18	60 %	22	73.3%		

Table (3) Signs and symptom of congenital nasolacrimal duct obstruction for routine massage group on pre, after 3 and 6 months.

Items	Pre		After 3months		After 6 months		χ^2 1	P1	χ^2 2	P2
	No	%	No	%	No	%				
Epiphora Not present	0	0.0%	0	0.0%	0	0.0%	3.24	>0.05	3.89	>0.05
Mild	0	0.0%	3	10.0%	3	10.0%				
Moderate	10	33.3%	10	33.3%	12	40.0%				
Sever	20	66.7%	17	56.7%	15	50.0%				
Mucous discharge Not present	0	0.0%	0	0.0%	0	0.0%	1.02	>0.05	0.22	>0.05
Mild	2	6.7%	2	6.7%	3	10.0%				
Moderate	22	73.3%	19	6.7%	21	70.0%				

Sever	6	20.0%	9	30.0%	6	20.0%				
Swelling around the eye Not present	0	0.0%	0	0.0%	0	0.0%	7.80	<0.05	7.85	<0.05
Mild	0	0.0%	4	13.3%	6	20.0%				
Moderate	26	86.7%	17	56.7%	18	60.0%				
Sever	4	13.3%	9	30.0%	6	20.0%				
Itching, burning or redness around the eye							4.73	>0.05	2.90	>0.05
Not present	2	6.7%	0	0.0%	0	0.0%				
Mild	2	6.7%	6	20.0%	3	10.0%				
Moderate	20	66.7%	16	53.3%	18	60.0%				
Sever	6	20.0%	8	26.7%	9	30.0%				
Change in visual acuity							7.2	<0.05	6.6	<0.05
Not present	0	0.0%	28	93.3%	30	100.0%				
Mild	24	80.0%	2	6.7%	0	0.0%				
Moderate	6	20.0%	0	0.0%	0	0.0%				
Nasal blockage Not present	0	0.0%	0	0.0%	0	0.0%	4.48	>0.05	4.48	>0.05
Mild	4	13.3%	0	0.0%	0	0.0%				
Moderate	22	73.3%	24	80.0%	24	80.0%				
Sever	4	13.3%	6	20.0%	6	20.0%				

P1: p-value for statistical difference between pre routine massage and after 3 months.
P2: p-value for statistical difference between pre routine massage and after 6 months.

Table (4) Signs and symptom of congenital nasolacrimal duct obstruction for therapeutic hydrostatic nasolacrimal massage group on pre and after 3 and 6 months.

Items	Pre		After 3 months		After 6 months		χ^2 1	P1	χ^2 2	P2
	No	%	No	%	No	%				
Epiphora							53.33	<0.001	60.0	<0.001
Not present	0	0.0%	10	33.3%	18	60.0%				
Mild	8	26.7%	18	60.0%	9	30.0%				
Moderate	10	33.3%	2	6.7%	3	10.0 %				
Sever	12	40.0%	0	0.0%	0	0.0%				
Mucous discharge							36.64	<0.001	52.80	<0.001
Not present	0	0.0%	10	33.3%	12	40.0%				
Mild	2	6.7%	15	50.0%	18	60.0%				
Moderate	22	73.3%	5	16.7%	0	0.0%				
Sever	6	20.0%	0	0.0%	0	0.0%				
Swelling around the eye							46.13	<0.001	60.0	<0.001
Not present	2	6.7%	13	43.3%	19	63.3%				
Mild	5	16.7%	13	43.3%	8	36.7%				
Moderate	19	63.3%	4	13.3%	3	26.7%				
Sever	4	13.3%	0	0.0%	0	0.0%				
Itching, burning or redness around the eye							32.81	<0.001	45.44	<0.001
Not present	2	6.7%	14	46.7%	19	63.3%				
Mild	2	6.7%	12	40.0%	7	24.1%				
Moderate	20	66.7%	4	13.3%	4	13.3%				
Sever	6	20.0%	0	0.0%	0	0.0%				
Change in visual acuity							12.00	<0.01	7.47	<0.05
Not present	24	80.0%	16	53.3%	29	96.7%				
Mild	0	0.0%	10	33.3%	1	3.3%				
Moderate	6	20.0%	4	13.3%	0	0.0%				
Nasal blockage							31.70	<0.001	44.74	<0.001
Not present	0	0.0%	13	43.3%	19	63.3%				
Mild	4	13.3%	12	40.0%	10	33.3%				
Moderate	22	73.3%	5	16.7%	1	3.3%				
Sever	4	13.3%	0	0.0%	0	0.0%				

P1: p-value for statistical difference between pre therapeutic hydrostatic nasolacrimal massage and after 3 months.
P2: p-value for statistical difference between pre therapeutic hydrostatic nasolacrimal massage and after 6 months.

Table (5) Total mean score and standard division of infants' clinical condition in therapeutic hydrostatic nasolacrimal massage and routine massage groups

Items	Total Mean Score and Standard Division for Therapeutic Hydrostatic Nasolacrimal Massage group	Total Mean Score and Standard Division for Routine Massage group	t test	P
Infant's clinical condition	24.83 ±2.01	13.60± 1.38	-25.16-	<0.001

Table (6) Comparison between signs and symptoms of congenital nasolacrimal duct obstruction after the implementation of routine massage and Therapeutic Hydrostatic nasolacrimal massage on pre and after 3 and 6 months

Items	Pre				After 3 months				After 6 months				χ² 1	χ² 2	χ² 3
	Routine massage		Therapeutic Hydrostatic Nasolacrimal Massage		Routine Massage		Therapeutic Hydrostatic Nasolacrimal Massage		Routine massage		Therapeutic Hydrostatic Nasolacrimal Massage		P1	P2	P3
	No	%	No	%	No	%	No	%	No	%	No	%			
Epiphora															
Not present	0	0.0%	0	0.0%	0	0.0%	10	33.3%	0	0.0%	18	60.0%	3.89	58.0	50.40
Mild	0	0.0%	8	26.7%	3	10.0%	18	60.0%	3	10.0%	9	30.0%	>0.05	<0.001	<0.001
Moderate	10	33.3%	10	33.3%	10	33.3%	2	6.7%	12	40.0%	3	10.0 %			
Sever	20	66.7%	12	40.0%	17	56.7%	0	0.0%	15	50.0%	0	0.0%			
Mucous discharge															
Not present	0	0.0%	0	0.0%	0	0.0%	10	33.3%	0	0.0%	12	40.0%	0.22	52.80	48.71
Mild	2	6.7%	2	6.7%	2	6.7%	15	50.0%	3	10.0%	23	60.0%	>0.05	<0.001	<0.001
Moderate	22	73.3%	22	73.3%	19	6.7%	5	16.7%	21	70.0%	7	0.0%			
Sever	6	20.0%	6	20.0%	9	30.0%	0	0.0%	6	20.0%	0	0.0%			
Swelling around the eye															
Not present	0	0.0%	2	6.7%	0	0.0%	13	43.3%	0	0.0%	19	63.3%	3.48	56.2	44.47
Mild	0	0.0%	5	16.7%	4	13.3%	13	43.3%	6	20.0%	8	36.7%	>0.05	<0.001	<0.001
Moderate	26	86.7%	19	63.3%	17	56.7%	4	13.3%	18	60.0%	3	26.7%			
Sever	4	13.3%	4	13.3%	9	30.0%	0	0.0%	6	20.0%	0	0.0%			
Itching, burning or redness around the eye															
Not present	2	6.7%	2	6.7%	0	0.0%	14	46.7%	0	0.0%	19	63.3%	2.90	54.4	47.5
Mild	2	6.7%	2	6.7%	6	20.0%	12	40.0%	3	10.0%	7	24.1%	>0.05	<0.001	<0.001
Moderate	20	66.7%	20	66.7%	16	53.3%	4	13.3%	18	60.0%	4	13.3%			
Sever	6	20.0%	6	20.0%	8	26.7%	0	0.0%	9	30.0%	0	0.0%			
Change in visual acuity															
Not present	0	0.0%	24	80.0%	28	93.3%	16	53.3%	30	100.0%	29	96.7%	4.48	7.47	1.01
Mild	24	80.0%	0	0.0%	2	6.7%	10	33.3%	0	0.0%	1	3.3%	>0.05	<0.05	>0.05
Moderate	6	20.0%	6	20.0%	0	0.0%	4	13.3%	0	0.0%	0	0.0%			
Nose blockage															
Not present	0	0.0%	0	0.0%	0	0.0%	13	43.3%	0	0.0%	19	63.3%	3.19	44.74	56.16
Mild to	4	13.3%	4	13.3%	0	0.0%	12	40.0%	0	0.0%	10	33.3%	>0.05	<0.001	<0.001
Moderate	22	73.3%	22	73.3%	24	80.0%	5	16.7%	24	80.0%	1	3.3%			
Sever	4	13.3%	4	13.3%	6	20.0%	0	0.0%	6	20.0%	0	0.0%			

P1: p-value for statistical difference between routine massage and therapeutic hydrostatic nasolacrimal massage on pre massage.
P2: p-value for statistical difference between routine massage and therapeutic hydrostatic nasolacrimal massage after 3 months of message.
P3: p-value for statistical difference between routine massage and therapeutic hydrostatic nasolacrimal massage after 6months of message.

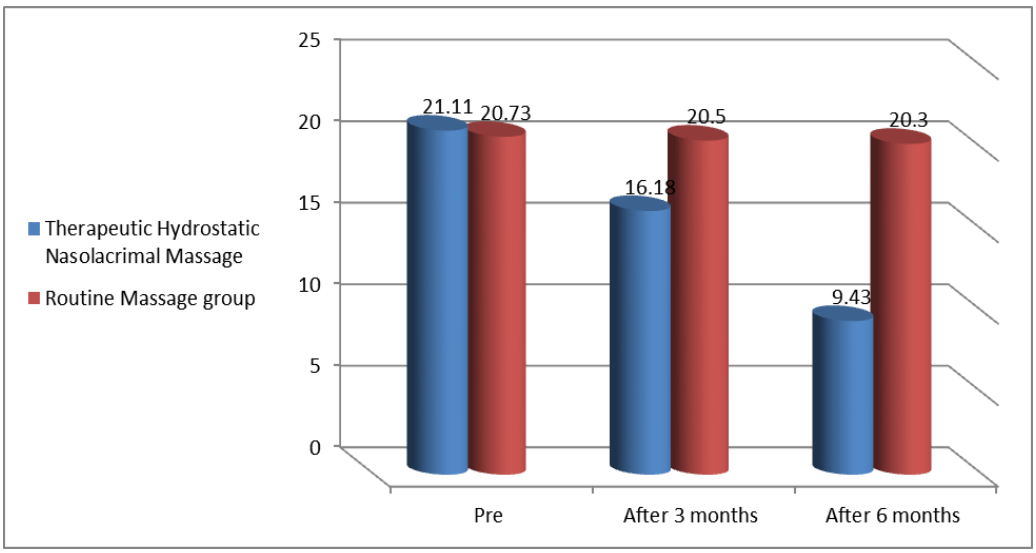

Figure (2) Total mean score of studied sample regarding signs and symptoms of studied infants on pre , after 3 and 6 months for therapeutic hydrostatic nasolacrimal massage and routine message group.

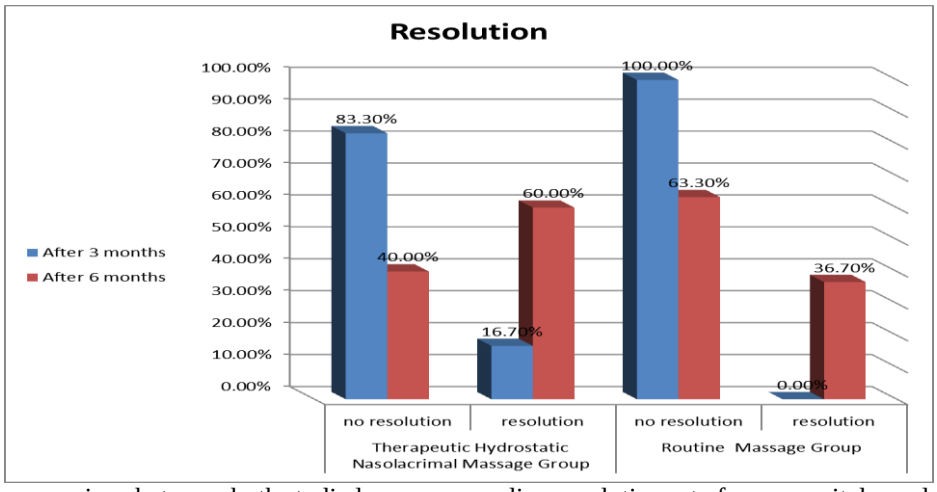

Figure (3): comparison between both studied groups regarding resolution rate for congenital nasolacrimal duct obstruction

V. Discussion

Congenital obstruction of the nasolacrimal duct (CONLD) is one of the most common ocular conditions in infancy, occurring in an estimated 1% to 20% of infants [10,11]. Most cases resolve after lacrimal sac massage or spontaneously [12]. This study was designed to assess the effect of therapeutic hydrostatic nasolacrimal massage Vs. routine hospital massage on congenital nasolacrimal duct obstruction.

The present study showed that more than half of both group their age were less than 6 months. These results come in agreement with Faisal, et al., (2014) [13] who indicated that the mean age of infants with persistent tearing was 3.2 months which correlates to the nature of the congenital disease. Also most of the infant in both experimental and control group had unilateral congenital nasolacrimal obstruction. On the other hand, The majority (60%) were female and (70%) were male in experimental and control group respectively. This was in line with the finding of Karti., et. al, (2016) [14] who stated that twenty-six (83.9 %) patients had unilateral (CONLD) and only five patients (16.1 %) had bilaterally. While, Noda, et al., (1991) [15] which examined 42 patients had nasolacrimal obstructions; the involvement was unilateral in 22 and bilateral in 20. Also, he mentioned that no sexual predilection was noted.

In addition, this study clarified that there was no statistical significant differences between experimental and control groups regarding possible risk factors for congenital nasolacrimal duct obstruction. This may be interpreted as the sample was selected with similar medical conditions. While, other study reported that maternal infection during pregnancy is one of the predispose factors to CONLD [13].

The current study revealed that there was no significant improvement after three and six months regarding signs and symptoms of congenital nasolacrimal duct obstruction after the implementation of routine message. Some of the mothers reported that common signs of the condition include tearing, discharge, and redness that are likely to cause itching or burning not improved.

Finding of the present study showed that infants who undergone therapeutic hydrostatic nasolacrimal massage were improved in their signs and symptoms after the period of three and six months.This could be attributed to the selection of suitable teaching methods e.g. demonstration and redemonstration for proper technique of message. Written booklet was given to the caregivers of the experimental group to follow it as needed.

This finding consistent with Stolovitch and Michaeli, (2006) [16] who stated that hydrostatic message is an effective way of resolving infant congential obstruction of nasolacrimal. Furthermore, the current study consistent with Noda et Al., (1991) [15] who described 42 infants with (CONLD) that were treated with hydrostatic massage at home by the parents several times a day. He stated that the improvement occurred in for approximately 67% of their infants and all duct obstructions were resolved by age 9 months. Other study indicated that (CONLD) resolution without any surgical intervention was reported in 62% (24.8 % had spontaneously patent duct and 37.2% resolved by hydrostatic message) [13].

This result was congruent with [17] who " compared 3 groups of patients treated at home for a control group (n 58), a hydrostatic massage group (n 59), and a simple massage group (n 58) until 6 months of age ". He mentioned that the hydrostatic massage group did much better than the two other groups.

In our study, we found that the rate of resolution was higher in infant's who used therapeutic hydrostatic nasolacrimal message when compared with the infants whose parents performed routine lacrimal sac massage. The resolution time was also earlier in patients who had therapeutic hydrostatic nasolacrimal message.

This occurred although there were no differences between the two groups in relation to their characteristics or possible risk factors for developing congenital nasolacrimal duct obstruction.

In addition, this study showed that there was significant improvement after six months in infants who had demonstrated therapeutic hydrostatic nasolacrimal message. This result was in agreement with the study of Karti O, et. Al., (2016) [14] who found that 3 % resolved between 0 and 3 months, 42.5 % resolved between 4 and 6 months, 33.3 % resolved between 7 and 9 months, and 21.2 % resolved between 10 and 12 months. On the other hand, The Pediatric Eye Disease Investigative Group (PEDIG) reported that 66 % of infants resolved with nonsurgical management within 6 months
[12, 18].

The condition of infants who undergone therapeutic hydrostatic nasolacrimal massage (24.83 ±2.01) improved more than who undergone routine message (13.60± 1.38). On the other hand, CONLD resolution occurs in 60% without any surgical intervention. These results show the importance of effective hydrostatic nasolacrimal massage. Hence, the importance of the hydrostatic nasolacrimal massage should be emphasized to mothers and described in detail to the mothers at each visit.

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VI. Conclusion

Based on the findings of the present study the following is concluded:
Infants with congenital nasolacrimal duct obstruction who received therapeutic hydrostatic nasolacrimal massage had marked improvement in their clinical signs and symptoms than infants who received routine hospital message. Also, the majority (60%) of Infants who received therapeutic hydrostatic nasolacrimal massage had experienced resolution rate for their nasolacrimal duct obstruction within 6 months.

Recommendation

Therapeutic hydrostatic nasolacrimal massage should be utilized for all infants who suffer from nasolacrimal duct obstruction. Also, training programs regarding therapeutic hydrostatic nasolacrimal massage should be designed for pediatric nurses and infants' caregivers.

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