

Chest Physiotherapy Techniques Used in Neonatal & Paediatric Intensive Care Units in Punjab

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Abstract

The purpose of this study was to observe the common chest physiotherapy techniques (CPT) used by physiotherapists in Neonatal and Paediatric Intensive Care Units (NICU & PICU) in the hospitals located in Punjab. The design of the study was exploratory cross sectional survey. Data was collected with the help of standardised questionnaire, which was sent to one hundred thirty therapists who worked in thirty eight different hospitals in Punjab and these hospitals have claimed physiotherapy facilities in their NICU and PICU premises. A period of two weeks was given to the therapists for the completion of questionnaire. If the therapists were not able to send the filled questionnaire within two weeks, then a reminder call was given to them for the next two consecutive weeks. It was found that only eighty-four (i.e. 64.61%) completed questionnaires was received from the twenty five hospitals. It was concluded that percussion, vibration, suctioning, positioning, breathing exercises of CPT techniques were commonly practised in both PICU and NICU.

Key words: ICU, Neonatal, Paediatric, Physiotherapy, Punjab

Introduction

The precise role of the physiotherapists in the Intensive Care Unit (ICU) varies considerably from one unit to the other, depending on factors such as the country in which the ICU is located, local tradition, staffing levels, training and expertise. The referral process is one such example of this variation. In some ICU's, physiotherapists assess all patients, whereas in other ICU's patients are seen only after referral from medical staff. Despite the emphasis on multidisciplinary team, the lack of role definition has resulted in many specialist physiotherapy services being subsumed

by other professional groups, mostly nursing staff. In spite of presence of strong evidence base to support the role of physiotherapists in the ICU, it has undermined the importance of providing specialist physiotherapists (*Jithendra et al, 2007*). NICU is a unit that provides high quality skilled care to critically ill neonates by offering facilities for continuous clinical, biochemical and radiological monitoring and use of life support systems with the aim of improving survival of babies (*Fernandez and Mondkar, 1993*). Pediatric intensive care unit is an area within a hospital specialising in the care of critically ill

infants, children, and teenagers. The ratio of professionals to patients is generally higher than in other areas of the hospital, reflecting the acuity of PICU patients and the risk of life-threatening complications (Pronovost *et al*, 2001). The role of ICU physical therapist is to promote healing and recovery and return the patient to the highest level of life participation and satisfaction. Physiotherapists are frequently found as members of the highly skilled team contributing to the infants' outcome. Although the physiotherapists role varies between neonatal intensive care units, it has traditionally focused on the respiratory care of infant, the education and training of physiotherapists and their role in relation to other health professionals, such as nurses varies greatly (Hudson and Box, 2003). The basic therapeutic principles in paediatric chest physiotherapy (CPT) are identical to those applied in adults. However, the child's growth and development results in continuing changes in respiratory structure and function, and the requirement for different applications of CPT in each age group (Zach and Oberwaldner, 1987). The objectives of CPT are to prevent or reduce the mechanical consequences of obstructing secretions, such as hyperinflation, atelectasis, maldistribution of ventilation, ventilation/perfusion mismatch and increased work of breathing.

Physiotherapy is sought when there is excess secretion, poor gas exchange, and increased work of breathing or radiologic evidence of atelectasis (Vaishali *et al*, 2012). Different techniques of cardiopulmonary physiotherapy including humidification, positioning, postural

drainage, percussion, vibration and endotracheal suctioning (Zach and Oberwaldner, 1999) are being employed. The role of physiotherapist in the NICU has been associated with the care of neonate lung. Postural drainage with percussion, vibration and suction are incorporated in physiotherapy management. In some institutions around the world extubation are also performed by physiotherapists in accordance with the neonatal unit protocol. In addition to respiratory care, the physiotherapists are also engaged in assessment and management of neonates with either neurological or musculoskeletal disorders (Bertone, 1988). The purpose of the study is to find the practice of Physiotherapy techniques and role of physiotherapists in the care of ill neonatal and pediatric population in NICU and PICU in Punjab state.

Materials & Methods

The design of the present study was exploratory cross sectional survey. The participants of the present study were physiotherapists and nurses who were working in NICU and PICU. They were requested to fill the questionnaire. A list of hospitals of Punjab state was obtained from the website of Govt. of Punjab, Department of Family and Health Welfare Society and also from various pediatricians across the state. Following which data collection was started from various hospitals and nursing homes in Punjab. The hospitals in Patiala district and nearby towns were personally visited by the investigator and data was collected from the therapists who were working in NICU and PICU. Questionnaires to the hospitals located in other districts of Punjab were sent either by e-mails or

personally by fellow colleagues. The investigator did not get the opportunity to meet every therapist personally. Two weeks time was given to the respondents to fill the questionnaire and after that a reminder call was given to them after consecutive one week. The aim and objectives of the study were clearly stated in a cover letter attached to the questionnaire in order to obtain the consent of respondents. The respondents were made clear that the information gathered from them shall remain confidential and would be used only for research purpose. Some therapists filled the questionnaire immediately whereas others asked the investigator to leave the blank questionnaire and collect the filled one at a later date. The investigator distributed the questionnaire to 130 therapists. Repeated requests were made to them regarding to fill the questionnaire two times after 2 weeks. Even after repeated requests made to the respondents, 46 questionnaires were not obtained and only 84 filled questionnaires were collected. Thus the response rate of this survey was 64.61%.

Results

A total of 84 completed questionnaires were received out of 130 (64.61% response rate) and the largest response was from Patiala followed by Mohali, Bathinda, Ludhiana, Muktsar. Table 1 shows the physiotherapy techniques frequently used in PICU and it was found that 91.67% respondents were involved in oxygen therapy, 90.48% in percussion, 77.38% in suctioning and nebulisation, 76.19% in breathing exercises, 73.80% and 72.62% in postural drainage and positioning respectively. 58.33% and 50% respondents were involved in assisted

coughing and huffing and only 14.29% were involved in incentive spirometry.

Table 1: Chest Physiotherapy Techniques used in PICU

Chest Physiotherapy Techniques	N	Percentage
Percussion only	76	90.48%
Vibration only	57	67.86%
suctioning only	65	77.38%
Positioning (Supine, side-lying, prone)	61	72.62%
Breathing exercises	64	76.19%
Incentive spirometry	12	14.29%
Ambulating non intubated patients in PICU	27	32.14%
Aerosol therapy	33	39.29%
Nebulisation	65	77.38%
Oxygen therapy	77	91.67%
Postural drainage	62	73.80%
Forced expiratory technique	40	47.62%
Assisted coughing	49	58.33%
Assisted huffing	42	50%

Table 2: Chest Physiotherapy Techniques used in NICU

Chest Physiotherapy Techniques	N	Percentage
Percussion only	55	65.48%
Vibration only	48	57.14%
suctioning only	56	66.67%
Positioning (Supine, side-lying, prone)	53	63.09%
Aerosol therapy	12	14.29%
Nebulisation	64	76.19%
Oxygen therapy	56	66.67%
Postural drainage	36	42.86%

Table 2 shows the physiotherapy techniques frequently used in NICU, the nebulisation was used by maximum respondents with 76.19% and 66.67% respondents were involved in suctioning, 65.48% in percussion, 57.14% in vibration, 63.09% in positioning and only 42.86% respondents were involved in postural drainage.

Table 3 shows that physiotherapy treatment techniques decided for patients and 57.1% respondents decided the techniques by discussing with doctors and 29% provided the physiotherapy treatment as per the prescription of doctor. Only 7% respondents decide techniques personally and 1.2% decides by discussing with nurses.

Table 3: Mode of Physiotherapy Treatment decided for patients

Physiotherapy Treatment	N	Percentage
Decided by Physiotherapist - personally	6	7.1%
Decided by Physiotherapist - discussing with doctors	48	57.1%
As per order of the doctor	29	34.5%
Decided by Physiotherapist - discussing with nurses	1	1.2%

Discussion

A total number of 48 hospitals were identified in Punjab with NICU and PICU facilities and 38 hospitals were invited for the study, out of which 25 responded. The investigator found very little or no considerable data regarding the role of Physiotherapy in NICU and PICU in India or any of its state and this study may be the first to report the practice of physiotherapy in NICU and PICU in Punjab state. *Lewis et al. (1992)*, reported that, methods of chest treatment and the indicators for commencing chest treatment were similar throughout NICU in Australia. *Norrenberg et al (2000)* study also showed that almost 100% of the ICU physiotherapists performed respiratory therapy, mobilization and positioning whereas in the study of *Robyn et al (2001)* techniques used by therapists in neonatal intensive care units were postural drainage no tip (35%), postural

drainage with tip (0%), non-specific positioning to alter ventilation (75%), vibrations (75%), percussion (75%), positioning prior to treatment (55%) and pre-extubation suction (55%). Other techniques used by physiotherapists in the overall management of neonates included water pillows (15%), peanut pillow (50%), nesting (90%) and techniques such as education, Fraser chair, bean bags and action pads (30%). Another study by *Jithendra et al (2007)* reported that 91% of the respondents were involved in chest manipulations (percussion, vibration, suctioning), 100% in mobilization, 100% in breathing exercises, 94% in incentive spirometry, 98% in postural drainage, 95% in assisted coughing in the ICU of India. Our study showed that 65.4% therapists were involved in Percussion, 57.14% in Vibration, 66.67% in suctioning, 63.09% in positioning, 42.86% in postural drainage in the NICU of Punjab. Other techniques used by the therapists were nebulisation (76.19%), oxygen therapy (66.67%), and aerosol therapy (14.29%) in the neonatal intensive care units whereas in the paediatric intensive care unit 90.48% therapists were involved in percussion, 67.86% in vibration, 77.38% in suctioning, 72.62% in positioning, 76.19% in breathing exercises, 14.29% in incentive spirometry, 73.80% in postural drainage, 47.62% in forced expiratory technique, 58.33% in assisted coughing, 50% in assisted huffing. Other techniques used by the therapists in paediatric intensive care unit were nebulisation (77.38%), oxygen therapy (91.67%), and aerosol therapy (39.29%). 32.14% therapists were also involved in ambulating no intubated patients in PICU. Less involvement of

therapists in NICU may be because of critical conditions of the neonates or because of lack of exposure to neonate population. In our study 57.1% respondents reported that treatment techniques applied to the patient were given after discussing with the doctor, 34.5% responded that they provide physiotherapy as per the order of the doctor and only 7.1% respondents decides personally about the treatment. 1.2% respondents also reported that they provide treatment after discussing with the nurses.

Conclusion: It was concluded that majority of CPT techniques were used in PICU as compared to NICU. It may be due to lack of exposure to neonate population or because of critical condition of the neonates and physiotherapy should be standard routine management of patients in intensive care units.

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