Neonatal resuscitation: A knowledge gap amongst obstetrical trainees

A Cross-sectional survey amongst medical graduates of Civil Hospital Karachi

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Abstract

Objective: To evaluate the neonatal resuscitation competence of obstetrical trainees to assess the gap in knowledge and to determine training needs.

Methods: The cross-sectional study was conducted at the Department of Gynaecology and Obstetrics, Civil Hospital, Karachi, from January to March 2013 and comprised House Officers and Postgraduate trainees. A questionnaire was used to test the evaluation skills of different conditions and choice of appropriate action required during neonatal resuscitation. Data was collected and analysed through SPSS 17.0.

Results: Of the 102 obstetrical trainees, 44 (43.1%) were House Officers and 58(56.9%) were Postgraduate trainees with an overall mean age 25.69±2.3 years. Only 19(18.6%) subjects cleared the test; 8(42.1%) of them were House Officers and 11(57.9%) were Postgraduate trainees. The result did not show any significant difference between those who had previous training or those who had performed neonatal resuscitation and those who had no such exposure. Majority, 92(90.2%) considered their knowledge inadequate and 99(97%) favoured that updated neonatal resuscitation programmes should be periodically arranged.

Conclusion: The study showed inadequate level of knowledge on neonatal resuscitation amongst obstetrical trainees. There is urgent need of formal training programmes which can make doctors skilful enough to face any adverse neonatal outcome professionally.

Keywords: Medical education, Neonate, Obstetrics, Resuscitation, Training. (JPMA 64: 856; 2014)

Introduction

Neonatal resuscitation is defined as the set of interventions at the time of birth to support the establishment of breathing and circulation.[1] The immediate change of environment of a new- born baby from a liquid-filled intrauterine cavity to a spontaneous breathing of air requires dramatic physiological changes and also experienced handling.[2] Effective neonatal resuscitation is, therefore, essential in reducing neonatal mortality when perinatal asphyxia is one of the most noticeable causes of fatality accounting for 9% of neonatal deaths. Inadequate resuscitation steps are estimated to affect about 4 million new-borns per annum and have a mortality of 2 million a year with 99% of deaths in developing countries.[3,4] A similar number of young ones pass through serious stages and develop complications such as cerebral palsy(CP).[5,6] Further, 30% of neonatal resuscitation steps are either not performed or are performed incorrectly. Pakistan ranks amongst the five countries that contribute 49% of all childhood deaths and eighth highest rate of neonatal deaths with infant mortality rate 61.27% deaths per thousand live births.[7] Such programmes have always remained a challenge due to scarcity of trained skill birth attendants and limited resources. In a region where about 500 new-borns die every day, only proper warming, drying, stimulation and resuscitation can reduce the mortality load.[8,9] These consequences can only be overcome if the birthing room personnel, particularly doctors, have sufficient knowledge and adequate skills about neonatal resuscitation. The current study was planned to evaluate the neonatal resuscitation competence of obstetrical trainees at a tertiary care centre to assess the gap in knowledge and to determine the need of training.

Subjects and Methods

The cross-sectional study was conducted at the Department of Gynaecology and Obstetrics, Unit I, II and III, Civil Hospital, Karachi (CHK), from January to March 2013 among House Officers and Postgraduate (PG) trainees with sufficient exposure to labour room. Those on duty during the study period and volunteered to fill the proforma after furnishing informed consent were included on the basis of convenient sampling. Those who

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refused were excluded. Besides, Senior Registrars as well as Assistant and Associate Professors were also excluded.

A self-administered, close-ended questionnaire was utilised to collect data from the subjects. The questionnaire was based on multiple choice questions (MCQs) derived from the Advanced Life Support of Obstetrical Emergency (ALSO), American Academy of Family Physicians Text Book of Neonatal Resuscitation,[10] whose protocol is followed in the CHK labour room. It consisted of simple questions based on basic steps done routinely, parameters used for evaluation of babies requiring assistance and appropriate decisions and actions like position of mask, etc. A minimum competence level of 75% and above was considered successful and defined as adequate knowledge regarding the topic. Data on their age, experience in medical service, previous training in neonatal resuscitation, their experience of neonatal resuscitation and their opinion regarding a Neonatal Resuscitation Programme was also collected.

Data collected was managed and analysed through SPSS 17.0 under the supervision of the Biostatistics department. All numeric values were expressed in frequencies and percentages. Categorical variables were compared using chi-square and t-test with the level of significance set at $p<0.05$. Data was expressed as mean ± standard deviation (SD) and 95% confidence interval (CI). Ethical approval for the study was obtained prior to the initiation of the study.

Results

Of the 110 medical graduates who were posted during the study period, 102(92.7%) filled up the form; 27(26.4%), 38(37.2%) and 37(36.3%) from Unit I, II and III respectively.

Overall, 44(43.1%) were House Officers and 58(56.9%) were PG trainees. The age range was 22-36 years with a mean age of 25.69±2.3 years. The median longest duration of experience in the working setup was 3-6 months. Average total score obtained by all participants in the test was 54.61±21.7 which was below the passing criteria that was at least 75%. Only 26(25.5%) had previous training in neonatal resuscitation from different setups and 47(46.1%) had performed neonatal resuscitation in the labour room on an average 5.6±4 per head.

When asked on initial steps in resuscitation, parameters used to assess the progress of new-born, position of head, position of mask, ratio of compressions to inflation breaths and others, only 19 (18.6%) participants cleared the overall test (Table-1).

Statistically insignificant results were obtained in all

Table-1: Queries and their responses.

Q #	Queries	Responses			
		Correct Answers	%	Incorrect Answers	%
1	Initial steps that are followed in sequence for resuscitation in labour room	60	58.8%	42	41.2%
2	Parameters that are necessary to assess the progress of new-born during resuscitation	75	73.5%	27	26.5%
3	Ideal position of head to clear the airway	31	30.4%	71	69.6%
4	Step to be taken if breathing is positive and heart rate is < 100	47	46.1%	55	53.9%
5	Step to be taken if heart rate is < 60	61	59.8%	41	40.2%
6	Method to apply mask for bag and mask ventilation	57	55.9%	45	44.1%
7	Ratio of compressions to inflation breaths	49	48%	53	52%

Table-2: Association of variables with scores.

Variables		< 75% Score		> 75% Score		Chi-square
		n	%	n	%	
Total	83	81.4%	19	18.6%		
Designation	House Officer	36	81.81%	8	18.18%	0.920*
	Post Graduates	47	81.03%	11	18.96%	
Ever performed neonatal resuscitation	Yes	41	87.23%	6	12.76%	0.160*
	No	42	76.36%	13	23.63%	
Ever trained for neonatal resuscitation	Yes	23	88.46%	3	11.53%	0.326**
	No	60	78.94%	16	21.05%	

* All expected counts are < 5, so chi-square applicable, Level of significance is 0.05

** At least one expected count < 5, so Fischer's Exact test applied, Level of significance is 0.05.

Table-3: Opinion of participants.

Opinion of interviewees	Yes N (%)	No N (%)	Total N (%)		
Satisfied with their knowledge (100%)	10 (9.8%)	92 (90.2%)	1	0	2
NRP should held in future (100%)	99 (97.1%)	3 (2.9%)	1	0	2

aspects when the result of the participants were compared in terms of designation, experience of performing neonatal resuscitation in labour room and training from those who cleared the test to those who did not (p>0.05) (Table-2).

Besides, 92(90.2%) subjects considered their knowledge inadequate and 99(97%) favoured that updated neonatal resuscitation programmes should be periodically arranged by the relevant authorities (Table-3).

Discussion

The findings of the current study are contrary to the idea regarding neonatal resuscitation as a standard of care.[11] It reflects an overall poor level of knowledge among the obstetrical trainees of CHK on neonatal resuscitation, thus indicative of a precarious situation in the public healthcare system and a matter of serious concern. In a public-sector study the mean percentage of medical officers in the neonatal component was 52.7±19.1, reflecting a deteriorating condition.[12] This is due to the reason that insufficient and inconsistent concern has been directed in this essential skill.

Similar observations have been made in other Third World countries where neonatal resuscitation is also a big challenge indicating that other developing nations are also surrounded by same set of problems. In a Brazil study, the approximate percentage of successful participants was only 23.75%.[13] However, in a study conducted in Kenya,[14] the percentage of successful participants was 35.4% which is almost twice our results. Although the average work experience for the study conducted in Kenya was approximately 9 years, but 35.4% was still not a satisfactory outcome. One could expect a better result in a population survey with such magnitude of experience and sample size compared to our setup, especially when Kenya and Pakistan have similar socioeconomic status, but as this is a matter of serious concern, we should not take the result lightly.

According to another observation made in the current study, nearly half of the participants (46.1%) had faced neonatal resuscitation more than five times and about quarter of them (25.5%) had previous training one could expect a much better score, but less than 20% could pass the test. As we compare it to another cross-sectional Kenyan survey study, only 12% had formal training while 71% of them even did not have exposure to neonatal resuscitation.[14] Similarly, in a study on neonatal resuscitation practice in Nigeria, only 14% participants had attended neonatal resuscitation training course within the preceding 5 years.[15] Their mean result (35.4% versus 18.6%)[14] was much better compared to ours, depicting an ailing health system. It also highlights the fact that medical centres currently providing training on the essentials of maternal and new-born care in the region can be counted on finger tips and the method of the remaining ones is quite old from the latest recommendations. That is why even many of those in the study who had taken previous training could not succeed. One can also expect that there must be lack of coordination between the trainers and the learners or there may be a gap between theoretical and practical knowledge. However, the current study was single-centre in nature with limited number of participants and the results may not be generalised. Only large-scale studies can serve the purpose.[16]

Our findings highlight the progressively deteriorating healthcare system at a large tertiary care centre, and it is only expected to be worse at other setups. Such surveys should also be held at other teaching hospitals as well as at secondary and primary healthcare levels like maternity care centres where the doctors who frequently deliver do not bother to receive any formal training or refresher courses after their graduation which further multiplies their lack of competence.

According to the standard goals of American Heart Association (AHA) and American Academy of Paediatrics (AAP) guidelines for neonatal resuscitation in 1985, "at least one person skilled in neonatal resuscitation should be in attendance at every delivery. An additional skilled person should be readily available."[16] Competence in resuscitation skills has been considered a minimum requirement in Pakistan for all healthcare providers since long. Poor performances of young medical graduates is attributable to their sub-optimal working conditions, poor infrastructure and lack of functional equipment needed for child-birth. Lack of resources also results in negative healthcare consequences and is a common problem in all developing countries, including Pakistan. The role of government is also distressing and deficiency of sincere efforts is seen on the government's part to improve the overall health situation of the country. GDP allocated for health is only 0.57 per cent which is much less than what Bangladesh and Sri Lanka spend on health

budget.[12,14]

According to previous studies[17-19] and clinical experience, knowledge and skill retention decline with time and the best way to pass on medical knowledge and skills is through apprenticeship.[20-22] It is good that the participants in the current study seemed to be interested in the subject and in learning the skill. The relevant authorities should also play their part. It is conceivable that the lack of knowledge noted in this study in terms of lower scores, can be offset through refresher courses and formal training programmes. Increasing the duration, quantity and quality of training programmes will also be helpful in changing the scenario. Special emphasis is required in undergraduate and postgraduate curricula and professional training programmes for obstetricians and paediatricians are highly recommended. Teaching methods should be modified to develop coordination among the learners and the demonstrators, and pitfalls should be analysed. There is need to convert the knowledge and skills gained by trainees into clinical practice. Neonatal resuscitation training should be incorporated into national neonatal strategies to complement the top priority of improved prevention of intrapartum-related deaths through obstetric care.[23] It is imperative that if obstetricians have sufficient knowledge of resuscitation skills, the outcomes are expected to improve and would enable a doctor to facilitate a neonate in one of the crucial periods of his/her life successfully.[24]

Conclusion

The level of knowledge about appropriate actions to be taken during neonatal resuscitation was well below the desired competence level, thus indicating a precarious situation. The introduction of routine and periodic training regarding neonatal resuscitation for medical graduates who frequently attend deliveries is a vital need of the time.

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