Original Research Article

A Study on Neonatal Tactile Stimulation at Birth

T.Bhavya[1*], Kesava Chandra Gunakala[2]

[1]2nd Year Post Graduate, Department of Obstetrics and Gynaecology,GGH, Kadapa, Andhra Pradesh, India

[2]Associate Professor, Departmentof Obstetrics and Gynaecology, GGH, Kadapa, Andhra Pradesh, India

Received: 12-02-2021 / Revised: 23-03-2021 / Accepted: 29-04-2021

Abstract

Background: Stimulation is the most common intervention during neonatal resuscitation at birth, but scarceinformation is available on the actual methods, timing and efficacy of this basic step. To evaluate the occurrence,patterns and response to tactile stimulation at birth in a low-resource setting. **Methods:** We reviewed 192 video recordings of neonatal resuscitation at GGH, Kadapa, Timing, method, duration and response to tactile stimulation were evaluated. **Results:** Among 1147 deliveries 192 out of 246 neonates received tactile stimulation while the remaqining 54 received chest compressions directly and some of babies directly got admitted in SNCU 192 received stimulation in the first minute after birth. Multiple techniques were administered in neonates. while recommended techniques like drying was given to 50(20.4%) babies, Back rub was given to 80(41.65%) babies, Chest rub was given to 20(10.4%) babies, foot flickering was given to 42(21.8%) babies. In the present study, Median duration of stimulation is 27 seconds. **Conclusions**:In a low-resource setting, stimulation of newly born infants at birth is underperformed. Adherence tointernational guidelines is low, resulting in delayed initiation, inadequate technique, prolonged duration and lowresponse to stimulation. Back rubs may provide some benefits, but large prospective studies comparing differentmethods of stimulation are required.

Keywords: Delivery room, Low-resource setting, Neonatal resuscitation, Newborn, Stimulation.

Introduction

Initiation of breathing is critical in the physiologic transition from intra-uterine to extra-uterine life [1]. In high-resource settings, approximately 85% of babies born at term initiate spontaneous respirations within 10 to 30 s after birth, 5– 10% respond to simple stimulation, 3–6% start breathing after basic resuscitation (positive-pressure ventilation, PPV) and less than 1% require advanced resuscitation (intubation, chest compressions and drugs) [2]. Resuscitation includes different interventions based on progressive steps. In low-resource settings, a large observational study in a rural hospital in Tanzania suggested that 85% of infantswould require only simple newborn care, whereas 15% would need stimulation, including 7% requiring bag-mask ventilation and less than 1% requiring advanced care [3]. The need for neonatal resuscitation is most urgent in low-resource settings, where access to intrapartum obstetric care is poor and long-term impairments from intrapartum-related events represent a heavy burden [4]. While babies requiring advanced resuscitation may not survive without ongoing ventilation and neonatal intensive care, neonatal mortality from intrapartum-related events in low- and middle-resourcesettings can be reduced by 30% with basic training in neonatal resuscitation [5]. Expert consensus estimates a 10% reduction in intrapartum-related deaths with immediate newborn assessment and stimulation alone [6]. Although stimulation is the most common intervention during neonatal resuscitation/stabilization at birth and is also recommended by all neonatal resuscitation guidelines, [7–9] scarce information is available on the actual methods, timing and efficacy of this basic step. A limited number of retrospective observational studies in high-resource settings have investigated this topic so far. Dekker et al. reviewed 164 neonatal stimulations at birth of infants with a gestational age of < 32 weeks and reported large variability in the use of tactile stimulation without a clearly demonstrable effect on infants [10]. Gaertner et al. evaluated video recordings of 75 stimulated infants, including very preterm infants, and suggested that truncal stimulation (drying, chest rubs and back rubs) might be more effective than foot flicks [11]. All authors indicated the need for further studies in order to confirm such preliminary findings. It is noteworthy that these results might underestimate the number of stimulations received by healthy near-term and at term newborns. Moreover, the number and types of stimulation may vary in different settings or with less experienced staff. The aim of this study was to evaluate the occurrence, patterns and response to tactile stimulation at birth in newly born infants in a low-resource setting

Aims and Objectives

•Aim of the study is to evaluate the occurrence, pattern and response to tactile stimulation at birth in newly born infants in low resource settings.

Methods

•Setting:This study was performed at teritiary care hospital-GGH,Kadapa.

This is a prospective study done over a period of two months (i.e., June and July) in the labour room, Department of Obstetrics and Gynaecology, GGH, Kadapa.

•246 babies who underwent resuscitation, their timings, methods, duration and response to tactile stimulation was evaluated.

Inclusion Criteria

- All neonates who were enrolled in the original study were considered for inclusion.
- Neonates who required stimulation were included.

Exclusion Criteria

- Lack of parental consent was the only exclusion criteria.

Procedure

Neonatal resuscitation was routinely performed under radiant warmers in the delivery room based on adapted algorithm of 2010 American Heart association guidelines with exclusion of medication and intubation.Stimulations like back rub i.e., any rub to the back, foot flick i.e., any stimulation targetting the sole,chest rub i.e., any rub to the front and side of the thorax and abdominal rub i.e.,any rub to the abdomen.

**Correspondence*

Dr. T. Bhavya

2nd Year Post Graduate, Department of Obstetrics and Gynaecology, GGH, Kadapa, Andhra Pradesh, India.

E-mail: divyatipparapu@gmail.com

Fig 1: Procedure

- Single type of stimulation can be given with atleast 2 seconds in between each stimulations.
- Concurrent stimulations can also be given like flicking the foot whilerubbing the chest.
- Only the stimulations that led to the complete new born recovery without need for further resuscitation were considered effective.

Outcome

- The main variable of interestwas the response of stimulation defined as complete newborn recovery i.e., spontaneous breathing without need for PPV.
- The initiation time,duration and the technique of stimulation were also evaluated.

Results

- Among 1147 deliveries 192 out of 246 neonates received tactile stimulation while the remaqining 54 received chest compressions directly and some of babies directly got admitted in SNCU
- 192 received stimulation in the first minute after birth.
- Multiple techniques were administered in neonates. while recommended techniques like drying was given to 50(20.4%) babies, Back rub was given to 80(41.65%) babies, Chest rub was given to 20(10.4%) babies, foot flickering was given to 42(21.8%) babies.
- In the present study, Median duration of stimulation is 27 seconds.

Table 1:Demographics

Demgraphics	Number
Noof stimulated neonates	192
Reasons for stimulations	
Apnea	2
Hypotonia	10
Apnea and Hypotonea	180
Mode of delivery	
Vaginal	116
Caesarean	76
Sex	
Male	118
Female	84
APGAR at 1 minute	5
AOGAR at 5 minutes	6

Table 2:Timing and Number of Stimulations

Number of stimulations	Time in seconds
Time elapsed from birth to stimulation in seconds	134
duration of first stimulation in seconds	4

Table 3: Techniques

Techniques	Number	%
Drying	50	20.14
Backrub	80	41.64
Chest rub	20	10.4
Foot flickering	42	21.8

The low no.of responding neonates prevented any meaningful analysis, butthe data suggested that rubbing the back might increase the stimulation.

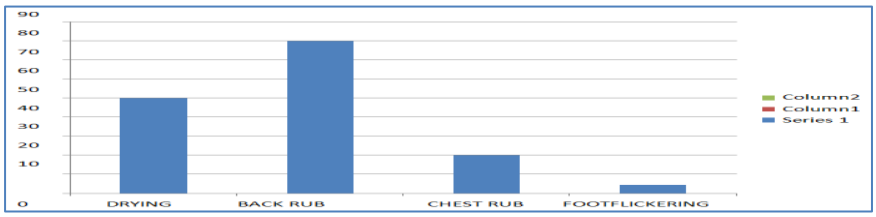

Fig 2: Types of Stimulation Techniques

Discussion

The present study evaluated the methods, timing and response to tactile stimulation in late preterm and full-term infants in low-resource settings. To our knowledge, only two retrospective studies conducted in preterm infants in high-resource settings, investigated such aspects [10, 11]. In these studies, the effect of stimulation was assessed as recovery of heart rate > 100 bpm and/or regaining breathing/increased breathing effort, [10] or as changes in crying, movement and grimace. [11] In the present study, the stimulation was considered as effective when it provided a complete newborn recovery, avoiding the need for PPV.Our main result was the very low number of infants (9%) who responded to stimulation. A previous study in Tanzania suggested that around 50% of newly born infants might respond to stimulation thus avoiding the need for PPV [3]. This difference could be related to some study features such as the different definition of response to stimulation, the inclusion of infants needing resuscitation under the infant warmer in our series and the resulting longer delay of initiation of stimulation. Face-mask ventilation is a crucial step in neonatal resuscitation but it is a difficult skill to teach and maintain in low-resource settings [12]. Therefore, effective stimulation during the first steps of resuscitation may reduce the need for additional neonatal resuscitation procedures such as face-mask ventilation or intubation.

Golden Minute(First 60 Sweconds)

It is vital for health care professionals and new born resuscitation providers to be cognizant of these basic principles while resuscitating a compromised new born and initiating action in golden minute. [11].

In my study effect of stimulation is assessed as recovery of heart rate more than 100 beats per minute or regaining breathing or changes in crying, movement and grimace

In my study stimulation was considered as effective when it provided complete newbornrecovery,avoiding the need for positive pressure ventilation.

Effective stimulations during first step of resuscitation may reduce the need for additional neonatal resuscitation procedures such as face mask ventilation or intubation. [10]

- Immediate newbornassesement and stimulation alone may avoid 1 out of 10 intrapartum deaths
- Stimulation like rubbing of the back seems promising in terms of response rate
- Median duration of stimulation is 27 seconds
- The prolonged duration of stimulation represents an additional hazard for infants , cause it delays the initiation of PPV thus compromising the overall resuscitation process. [12]

Conclusion

- In my study rubbing of back showed more benefit compared to other stimulations
- In low resource settings stimulation of infants is under performed
- Adherence to international guidance is low,resulting in delayed initiation and low response to stimulation.
- It is concluded that basic knowledge and practice has to be inculcated in low resource settings for better managmemt of neonates.

Acknowledgment

The author is thankful to Department of OBG for providing all the facilities to carry out this work.

Conflict of Interest: Nil

Source of support:Nil

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