Newborn

Resuscitation in Ayurveda with Reference to Care of



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ABSTRACT



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Background: Newborn constitutes the foundation of human life. Every birth must be considered as a medical emergency. In the uterus, the Placenta serves to transfer nutrition and oxygen from the mother. After separation from the mother, the baby must breathe immediately to safeguard against anoxic damage to the brain and other vital organs. In the labour room, the newly born baby should help to establish independent breathing without delay to avoid asphyxiated morbidity and quality of life among survivors. Most babies have a smooth transition from foetal to neonatal life and establish spontaneous breathing at birth without any active assistance. About 5% to 10% of babies are likely to have difficulty initiating spontaneous breathing at birth and need active resuscitation. In such conditions, resuscitative measures should be promptly followed. It requires excellent assessment skills, having a resuscitation team and a thorough understanding of foetal and neonatal physiology.

Objective: Study the principles behind Ayurvedic care of newborn and the procedure of Pranapratyagamana.

Methods: This review study has been extensively revised and updated to include recent advances and understanding of Ayurvedic principles behind the procedure of pranapratyagamana and care of the newborn. The study included evidence-based information from a comprehensive textbook of Ayurveda as well as modern science.

Results: Ayurvedic procedures performed to resuscitating the child are useful and based on sound scientific knowledge.

Conclusion: Ayurvedic practices are more appropriate to serve health need as they are based on simple technology and availability is at the doorstep of the people.Najaat shishu paricharya.

Key Words: Pranapratyagamana, Resuscitation, Newborn Care, Najaat Shishu paricharya

INTRODUCTION

Resuscitation (rise again) is defined as the act of reviving a newborn from unconsciousness, administering emergency measures to support adaptation with airway, breathing and circulation of the newborn to extrauterine life.¹ Immediately after birth (the moment the baby come out of maternal passages); the question that arise is about evidence of baby breathing or crying. When the answer to the above question is YES, the baby needs routine care but when the answer is NO, the baby is provided resuscitation. In *Ayurveda*, the word resuscitation is replaced by *Prana pratyagaman*. The word meaning of resuscitation is the procedure used for apparently lifting the baby from death-like condition. The meaning of *Prana pratyagaman* is Re-establishing the vital *Prana* back in the body². Both words carry equal meaning. The respirations which commenced, and enfeebled by the labour pains thus become vigorous. Stimuli for the first breath may be multifactorial. The first functional breath after birth is produced by the integrated activity.² The environmental changes that occur with birth, is tactile and thermal, increased noise and light; activate several sensory receptors that may help initiate and maintain breathing. The carotid bodies and peripheral chemoreceptors located at the bifurcation of the common carotids are stimulated during hypoxia to increase minute ventilation. Soon after birth, the foetal respiratory activity must transition to normal spontaneous breathing. To overcome the viscosity and resistance of fluid-filled lungs, the recoil and resistance of the chest wall, the lungs and airways of the infants must generate negative pressure so that air moves from an area of higher pressure to one of lower pressure. In asphyxiated infants



who cannot increase minute ventilation, profound bradycardia may resulted.³

MATERIALS AND METHODS

Foetal breathing or chest wall and diaphragmatic movements begin at approximately 11 weeks of gestation and increases in strength and frequency throughout gestation. Neonatal transition requires spontaneous breathing and successful cardiopulmonary changes as well as other changes to independent organ system functions. The first minute of life (Golden minute) is considered as crucial for the integrity and survival of a newborn baby. The first functional breath after birth is produced by the integrated activity of several stimuli, hypoxia, acidosis, cord occlusion and thermal changes. During intrauterine life, the foetal lungs are filled with fluid and they do not serve any ventilatory purpose since the placenta supplies oxygen to the foetus. During vaginal delivery, one-third of foetal lung fluid is removed as the chest is squeezed and lungs fluid comes out of the nose and mouth. The first new breaths of most newborn babies are extremely powerful to inflate the alveoli and replace the lung fluid with air.4 Infant who is apnoeic at birth and those having weak respiratory efforts cannot achieve this function. If a fetus is exposed to hypoxia due to any reason, the fetus behave like a strangulated individual and make desperate movements that end with reduced or absent movements. At birth the lungs must transit (change) rapidly to become the sight for gas exchange, otherwise, cyanosis and hypoxia develops rapidly.4 Most babies have a smooth transition from foetal to neonatal life and establish spontaneous breathing at birth without any active assistance. About 5% to 10% of babies are likely to have difficulty initiating spontaneous breathing at birth and need active resuscitation. In such conditions, resuscitative measures should be promptly followed. It requires excellent assessment skills, having a resuscitation team and a thorough understanding of fetal and neonatal physiology.5

Newborn infants who need extensive resuscitation should be rapidly identified. Term infants with clear amniotic fluid, adequate respiratory efforts and good muscle tone should receive routine care. The goals of resuscitation are to assist the baby with the initiation and maintenance of adequate ventilation and oxygenation. Along with this adequate cardiac output, tissue perfusion, normal coral temperature and serum glucose are also maintained. These goals may be attained more rapidly when risk factors are identified early, neonatal problems are anticipated, equipment is available, personnel are qualified and trained and a care plan is formulated. Infants do not meet the criteria for routine care need additional steps in their resuscitation. This includes the initial stabilization (provide warmth, position, clear the airway, dry stimulate and reposition). It may also include ventilation, chest compression and medication.⁶

The methodology includes a detailed description of Ayurvedic procedures of Resuscitation and its scientific approach. Every birth must be considered as a medical emergency. In the uterus, the Placenta serves to transfer nutrition and oxygen from the mother. After separation from the mother, the baby must breathe immediately to safeguard against anoxic damage to the brain and other vital organs. In the labour room, the newly born baby should help to establish independent breathing without delay to avoid asphyxiated morbidity and quality of life among survivors. Conditions required resuscitation are;

- 1. Poster babies have more risk of asphyxia
- 2. Preterm babies have more risk due to lungs immaturity
- 3. IUGR babies
- 4. Problems related to uterine contractions
- 5. Abnormal presentations
- 6. Chromosomal anomalies
- 7. Maternal disorders
- 8. Drugs and procedure during pregnancy
- 9. Congenital problems with the baby
- 10. Meconium aspiration⁷

In *Ayurveda*, the word resuscitation is replaced by *Prana pratyagaman*. The word meaning of resuscitation is a procedure used for apparently lifting the baby from death-like condition. The meaning of *Prana pratyagaman* is Re-establishing the vital *Prana* back in the body. Both word carry equal meaning.

स्तस्यास्तु खल्वपरायाः प्रपतनार्थे कर्मण कि्रयिमाणे जातमात्रस्य अश्मनोः सम्घट्ट्नम् कर्णयोमुले , शतिोदकनोष्णोदकन वा मुखपरषिकः , तथा सम्क्लेशवहितिा कर्मणभिवन्त ; तदयथा -न् प्राणान् पुनर्लभेत ।

कृष्णकपालकिाशुर्पेन चैनम् अभनिषि्पुनयिुर्य् द्य चेष्टः स्याद्यवत प्राणानां प्रत्यागमनं ॥ च. शा . ८ / ४२

Charaka mentions different procedures to be conducted immediately after birth in case of Achestha Shishu -baby showing no movements (chestha) or any signs and symptoms of life at birth. The asphyxiated baby does not cry, is unconscious or restless due to instability of *dhatus* and has hyper-aesthesia; to revive the child do the necessary measures. Word Achesta can be correlated with asphyxiated state, terminal or secondary apnoea like conditions with APAGAR score less than 2 at one 1 minute or 5 minutes. This Achesta might have occurred due to prenatal events, antenatal events, aspirations, primary apnoea, terminal apnoea etc. resulting in the unconscious, none crying, Limp, flaccid baby at birth. Such baby should be resuscitated with the procedures mentioned, till it regains Chestha or till there is the re-entry of vital Vayu Prana inside the body is evidenced. This clearly shows Charaka has faced situations of the floppy baby without spontaneous respiration giving rise to the impression that *Prana* has left out of the body. In such cases, it should be treated till its recovery and vital *Prana* should be re-established in the body. This explains the resuscitation of the baby in *Ayurveda*.^{7,8}

Following procedures were done to stimulate respiration

All these procedures are aimed to revive the unconscious baby by initiating resuscitation, pulse, heart rate like vital functions. When we compare modern methods of resuscitation, principles adopted behind these procedures explore scientific knowledge.

अश्मनोःसम्घट्ट्नम् कर्णयोमुले;

This is the first procedure that should be done when the baby is not crying or *Achestha*. Two stone pieces are taken and stroked together to produce a dull sound near the base of the ear (mastoid process). This leads to the stimulation of respiration.

How this will help to revive the baby?

Sensory stimulation: Receptors for different sensations are present in the skin, like the receptors for pain, heat, vibration, pressure, crude touch, fine touch etc. As we know all the sensations from the peripheral parts of the body are carried through the sensory tract. These sensations are carried through the sensory tract in the posterior lobe of the spinal cord. These fibers are riches to the hypothalamus and then cross to the opposite side. When it crosses, it also gives a branch to the respiratory Centre therefore, an extreme degree of sensory stimulation is always associated with stimulation of respiration this is also true in higher sensory functions like hearing, vision etc. which are connected with the respiratory Centre through respective cranial nerves. Hence stimulation of the sensory pathway is one of the easiest indirect methods to stimulate the respiratory centre.

Modern approach

The modern method of resuscitation also believes in the stimulation of respiration by the sensory stimulus. Methods of sensory stimulation are cleaning and drying of the baby along with the face, striking the palms and soles, pressure and pain sensation. Rubbing at the back (spinal cord) area is direct stimulation of the sensory pathway.⁹

Examination of reflex

There is reflex by name startling reflex. By striking stones near the ear base, we are eliciting startling reflex-like stimulation which helps to identify the alertness of the baby. Stimulation at the base of the ear - is direct stimulation of the respiratory centre. It has been told that sounds should be produced at the base of the ear which corresponds to the mastoid area where the vestibule-cochlear nerve passes through. While testing conductive deafness also keep tuning the fork at the level of the mastoid area only.

Why stones are selected rather than metal as we can produce a louder sound by striking metal rods instead of stone intentions may be as follows stones are easily available, sharp sound of metals may damage the Labyrinth, loud sound may cause reflex bradycardia in baby, stones produce a dull sound which is comfortable.¹⁰

शतिोदकेनोष्णोदकेन वा मुखपरषिक;

This is the second procedure in the sequence of resuscitation, hot and cold water should be sprinkled over the face of the baby alternatively. Sensory receptors which are abundantly present on the facial skin are stimulated by hot and cold sensation. Sensation will be carried through the sensory segment of the facial nerve and the Trigeminal nerve to stimulate the respiratory centre. In the hot season, cold water and in winter season hot water can be used. Hot and cold water can be sprinkled alternatively. Sensory stimulation by hot and cold sensation for initiation of breathing-

This looks to be the second method of sensory stimulation by heat- cold sensation so that the respiratory centre is stimulated. In the first step, they have tried with the Shabda Guna of the Akash Mahabhoot, a failure to which necessitates simulation of Vayu mahabhut with its Sparsha Guna(touch which is also a second-most perceptive Guna by the body). An alternate sprinkling of hot and cold water also stimulates the sympathetic nervous system, which in turn stimulates the respiratory centre. A baby with apnoea can be easily awakened by this method. A sprinkling of cold water to a person during the state of unconsciousness/semi-consciousness is generally practised in community practice, which also works on the same principle. Minor cases will be revived by this method. This should not be done continuously. If the baby is not responding after doing it three to four-time we have to go for the next step of Prana pratyagaman modern science also believes in the same that one should not waste time on giving sensory stimulation if the baby is not responding rather, quickly shift to bag and mask ventilation. Prolonged sprinkling also carries the risk of hypothermia.¹¹

Thus s *Ashmno Sangathana* looks to be the stimulation of respiration by sensation carrying in through the vestibulecochlear pathway guided by sound stimulus, while in the case of touch stimulus, in this procedure drying causes stimulation of the trigeminal nerve pathway. Sudden cooling after birth when the human newborn baby is delivered may lose up to 600-kilocalorie per minute at room temperature provides respiratory drive by operating through trigeminal cold receptors located on the facial skin.¹² The sudden sprinkling of cold water over the facial region may serve the purpose. The further facial area is the *Adhistana* of maximum *Indriyas* like *shabda*, *Rasa*, *Ghrana* etc. Hence it is easy to stimulate all *Indriyas* by *Mukha parisheka*. Blood circulation is maximum on the facial area and the face is supplied by external carotid arteries which are connected to the internal carotid artery containing baroreceptors. The rule of baroreceptors in the stimulation of respiration is well known. If these two methods of sensory- stimulation fail to revive the baby immediately shift to the next method.

कृष्णकपालकिाशुर्पेन चैनम् अभनिषि्पुनयिुर्य् द्य चेष्टः स्याद्यवत प्राणानां प्रत्यागमनं;

When both the above procedures have failed, this method of stimulation is indicated. This is a method, where fresh air or oxygenated air is provided to the baby by continuous fanning over the area where the baby is kept. For fanning, a black colour earthen broken pots and winnowing basket made out of broad leaves are used. This method is continued till the baby start breathing spontaneously. This looks like a method of ventilating the baby by using room air which contains 21% of Oxygen and which is sufficient to ventilate the baby in emergency conditions. Many times bag and mask ventilation is also carried out by using room air during an emergency. Fanning the spot where the baby has been kept, replaces the impure air and creates a negative pressure on the spot which results in fresh air being sucked into the spot.

This provides a high concentration of O2 to the baby. Winnowing basket can be made into a square shape structure where the baby's head will be placed and meanwhile fanning will be continued. This method provides steel higher connection of O2 to the square area. This method is almost similar to the oxygen Hood box method, where the baby will be provided with a higher concentration of O2. This method is almost similar to free-flow oxygen therapy or nursing the baby under the oxygenated box. Of course, an advanced method like bag and mask (positive pressure ventilation) where mechanically air is pushed inside to initiate respiration has not been mentioned in Ayurveda. Modification of atmospheric air or oxygen- Although the method of collection of oxygen was unknown to them, they will well be versed in the modification of oxygen present/ available air that is existing in the atmosphere. Haritha gives the concept of the modification of the Year he explains five variety of fanning air for the baby. Here atmospheric air while passing through a particular fanning material gets modified. This is just like a hundred per cent O₂ collected in O₂ cylinder when made to pass through water gets converted into humidified oxygen which is comfortable for the body and is devoid of the bad effects of dry oxygen.¹³ Ayurveda explains the modification of air as follows.

Fanning with the leaves of Bamboo air becomes- dry and induces sleep. Fanning with the *Kamsya Patra* absorbed the sweat, suppresses *Vata*.

Fanning with the red cloth harmful and it's contraindicated.

Fanning with a palm tree or Banana leaves is very good as it relieves the fatigue, the air become humid brings down *daha*, *pitta* and induces sleep. When air passes through a banana leaf, gets moistened and humidified due to *sheeta guna* of *Kadhi Patra*. This is almost similar to humidified oxygen.

Why Krishna kapalika is used-

Krishna kapalika is commonly available in those days or light for use. The black colour absorbs heat imparts coldness.

Black colour helps to protect from physiological photophobia. Alternate black and white Fanning may initiate a light reflex that is *Rupa Guna Teja*. This helps in the initiation of breathing by stimulating visual sensation.¹⁴

पचिु धारण

Pichu dharan is well explained by Sushruta. A Kavalika (cotton pad) has to be dipped in the oil medium like Bala tail and kept in the Brahma Randra pradesha. This point where Pichu has to be placed refers to anterior fontanels, the soft area over the skull which is devoid of ossification and prone to injuries. Hence it protects this highly sensitive area. This may be aimed to prevent and hyperthermia during resuscitation as maximum heat loss take place through the scalp and forehead area. Hence Kavalika covers this area. This procedure may provide an opportunity for examination of anterior fontanels for its elevation of intracranial pressure, haemorrhage, for depression, shock, fluid loss or injuries, so that early management will be insured. Tail which is dedicated to dipping Kavalika is Bala taila which is very good for suppression of Vata. This is proved for its beneficial effects in neurological disorders.^{15, 16}

मंत्र उच्चारण

After striking the stones near the base of the ear and by doing *Bala taila Parisechana* if the baby is not revived then the last step is chanting *Mantra* near the base of the right ear. *The mantra* which is explained by *Astanga Hridaya* has to be chanted by the father on the ear of the baby if the baby has not revived by doing all the procedures of resuscitation. Now the concept of *Mantra* which is mentioned in this context does not tell about the type of *mantra* to be chanted. This may be one method of auditory stimulation as the father whispers in the ear of the baby or as a last attempt/ hope to revive the baby if it's *Atma Bala* and *Daiva Bala* is good.^{17,18}

Effectiveness of the *Mantra chikitsa* in reviving the baby-Vedic rhymes or *Veda Mantras* have a specific way of chanting by maintaining Rhythm, frequency, amplitude. When this is chanted for a long time this may stimulate electromagnetic waves of the brain and in turn, stimulate respiration. Mantras too act as an auditory method of stimulation. *Sama* Veda Mantra can be considered as the great musical rhymes that can be considered under music therapy and the role of music therapy to reduce the stress factor is a topic of hot discussion nowadays. Mantras are considered as the last option when there is no hope of saving the baby sometime by luck or *Atma bala*, *Daiva bala* of the baby it may work, hence this method might have been tried such similar explanations are seen in other disorders also. In asphyxiated infants who cannot increase minute ventilation, profound bradycardia may result.¹⁹

TABC of resuscitation in Ayurveda

T - Temperature is maintained as

- 1. Construction of *Sutikagara* by heat resistant materials.
- 2. Continuously burning stems of medical drugs.
- 3. Lighting a lamp of Sarshapa taila.
- 4. Construction of *Sutikagara* by keeping a view of airflow- sunlight (south and east facing).
- 5. Closely packed from all sides.

A-Airway

- 1. Mukha Shodhana by the index finger.
- 2. Cleaning of Kantha Pradesha.
- 3. Keeping a baby on a flat surface.
- 4. Garbhodaka Vaman by Saindhava and Sarpi

B – Breathing

- 1. Fanning the baby.
- 2. Different sensory stimulations to initiate breathing.
- 3. Fanning with different leaves to moisten the air.

C – Circulation

- 1. Pichu dharan
- 2. Raksha karma
- 3. Balataila abyanga
- *4. Temperature maintainance*
- 5. Jatkarma samskara
- 6. Stanyapanayana
- 7. Suwarna prash atipooj
- 8. Namakarana samskara
- 9. Karna vyadhana
- 10. Chooda karma.

Complications and their management

The affected child may develop deep unconsciousness or coma, generalized increase in body temperature, unable to cry excessively according to bodyache, *rasa*, *rakta mamsa* etc *dhatus* are unstable during this condition. *Dhatus* do not attend maturity state or in other words, *dhatus* do not reach up to their final normal metabolite which keeps the body in normal state., touch by hand cloth or bed gives the pain as it is being cut by the saw; that is in hyperesthesia stage other parameters are continuous involuntary movements of body parts being unconsciousness the baby frequently seems dead that is apnea beings developed due to obstruction of the foetus and compressed by the uterine muscles. In such conditions to revive the baby, Bala oil irrigation should be done along with striking stones near to the ear.

The Bala oil is prepared with many drugs which may be useful to review the baby as well as in combating many complications by providing drugs through the skin. The above-said complications seem similar to the feature of HIE(Hypoxic Ischemic Encephalopathy) that appears in its different stages.²⁰

DISCUSSION

The ancestral or conventional child care practices are by and large, based on core knowledge and wisdom although some of them may have emerged purely from institutional superstitions and unfounded beliefs. Ayurveda means knowledge of life and art of science of living.^{17,18} Ayurveda adds not only years to life but also life to years. Most of our health care practices have their origin in our traditions based on the core knowledge and wisdom of our ancestor. These practices are easy and a part of our lifestyle. They are available in the footstep of the people and they are readily acceptable to society. To promote these practices of indigenous medicines, the government of India provided the medicines called AYUSH medicine to treat common day to day illness .there is a need to do further research to ascertain the efficacy and safety of these procedures comes from the Indian system of medicine. In Ayurveda the word resuscitation is replaced by Prana pratyagaman. The word meaning of resuscitation is the procedure used for apparently lifting the baby from death-like condition. The meaning of Prana pratyagaman is Re-establishing the vital Prana back in the body. Both words carry equal meaning. The procedures described in Ayurvedic classic regarding resuscitation of a newborn child are timehonoured and easily available in the surroundings of human being.20

CONCLUSION

The procedures mentioned in Ayurveda to pranapratyagamana (resuscitate) are defined as the total of the knowledge, skills and practices based on the theories of the indigenous system. Though most of these procedures are harmless and having a scientific base but due to lack of their utility they may lead to seeking medical aid with resultant deterioration in the condition of the newborn child.

ACKNOWLEDGEMENT

The author's acknowledge the immense help received from Datta Meghe Ayurvedic Medical College, Hospital and Research Centre Nagpur for concluding the present study.

Conflict of interest: None

Source of funding: Nil

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