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EARLIEST DIAGNOSIS OF NEUROLOGICAL PROBLEMS IN NEONATE BY NEONATAL REFLEXES

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ABSTRACT

A newborn baby can present with a variety of neurological problems that stem from condition that affect his brain, spinal cord, peripheral nerves and muscles. These disorders can be present at birth or happen shortly after birth. A neonatal neurological examination is a cornerstone in assessment of a neonate's neurological function. Early recognition of abnormal findings can prevent delays in diagnosis and implementation of beneficial therapies. The neonatal neurological examination mostly the neonatal reflexes remain highly informative, cost effective and time efficient technique in the care of neonate. Neonatal reflexes are vital indicators of neurological and physical development and play crucial role in evaluating their overall health and well-being. Reflexes are an essential component to be tested in newborn to detect the normality and abnormality earlier so that appropriate measures can be taken in case of any emergency. This study is designed for better understanding and early recognition of abnormal findings in neonate. Knowledge of neonatal reflexes is important for application of overall assessment of baby, recognition of possible neurodevelopmental damage & establishment of prognosis for future and predicting the child's future potential.

KEYWORDS: Cornerstone, Neonate, Neonatal reflexes, Neurological problems.

INTRODUCTION

A newborn baby can present with a variety of neurological problems that stem from condition that affect his brain, spinal cord, peripheral nerves and muscles. These disorders can be present at birth or happen shortly after birth.

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Neonatal reflexes are vital indicators of neurological and physical development and play crucial role in evaluating their overall health and well-being. Reflexes are an essential component to be tested in new born to detect the normality and abnormality earlier so that appropriate measures can be taken in case of any emergency.

Primitive reflexes are involuntary motor responses originating in the brainstem present after birth in early child development that facilitate survival. Several reflexes are important in the assessment of newborns and young infants. These central nervous system motor responses are eventually inhibited by 4 to 6 months of age as the brain matures and replaces them with voluntary motor activities but may return with the presence of neurological disease.[1,2] It is important to understand how to correctly elicit these responses for early diagnosis of possible lifelong complications. The adult reemergence of primitive reflexes indicates the potential for several brain pathologies.[3,4,5]

In a 2011 study, morbidity-related factors statistically correlated with the sucking and Babinski reflexes. Moro reflex is weak in preterm infants compared to full-term infants due to their poor muscle tone and resistance to passive movements.[6,1] This response correlates with a delay in motor development in very low birth weight infants. The absence of the Moro reflex suggests CNS dysfunction.[7] Persistence of primitive reflexes past 4 to 6 months or absence before this time when they should have been present is predictive of cerebral palsy.[8] The presence of 5 or more abnormal reflexes correlated with the development of cerebral palsy or mental delays.[4]

DEFINITION

A newborn reflex is a response of a newborn to a stimulus and that occurs without conscious thought.[9]

Reflexes of Eye						
Reflex	**Stimulation**	**Response**	**Age of Appearancece**	**Age of disappearance**	**Purpose/ Significance of reflex**	**Significance for absence of reflex**
1. Blinking	The cornea is touched	Involuntary blinking of the eyelid	Birth	Does not disappear	Protect the eyes from foreign bodies and bright lights	Dysfunctional blink reflex results due to damage at pathway of central or peripheral nervous system
2. Pupilla ry reaction	Bright light falls on eyes	Pupil constrict	Birth	Does not disappear	1. Indicates balance between the sympathetic and parasympathetic nervous systems 2. Its nature gives an indication of muscle tone.	Hypotonia is described as the inability of the arms or hands to move freely or completely open.
3.Doll's eye or Oculo cephalic	Head is moved to right or left	Eye lag behind and do not immediately y adjust to new position	Birth	3-4month	Indicating an intact brainstem function	Asymmetrical in hemiplegia and cerebral damage
4. Sneeze	Roll the cotton into a point, and place it in one nostril. Gently move the tissue back and forth,	Spontaneous response of nasal passage by sneezing	Birth	Does not disappear	Sneezing is a natural defence system to rid the baby's nose of billions of irritants	Sneezing abnor malities are usually caused by irritation of the trigeminal nerve terminals

	until feeling a ticklingsensation					in the nasal mucosa.
5. Glabell ar or Myerso n sign	Tapping briskly onbridge of nose	Eyes closetightly	Birth	Does not disappear	Indicates the good condition of trigeminal nerve	Abnormal frontal release. Absent when there is sensory loss
Reflexes of Mouth						
6. Rooting	The baby's mouth corner is stroked or touched.	The baby turns his head and open mouth to follow direction of stroking.	Birth	3-4month	It helps the baby to find the breast or bottle to start feeding	Absence seen in neurologically impaired infants.
7. Sucking	The roof of the baby's mouth is touched	Baby beginto suck	Birth	Persists during infancy	Helps in breast or bottle feeding	Persistence may inhibit voluntary sucking. Absence sucking at birth indicate sickness, Persistence beyond 7 months indicate developmental delay
8. Gag or Pharyngeal	Stimulation of posterior pharynx byfood or suction	Infant gag	Birth	Persists through-outlife	It helps to prevent choking and protect from swallowing potentially	Damage to the glossopharynge al nerve, the vagus nerve and brain death

					harmful substances	
9. Extrusi on or tongue thrust	Tongue is touched ordepressed	Infant respond by forcing it outward	Birth	4th month	It helps to protect babies from choking or aspirating food and other foreign objects and helps them to latch onto a nipple	Underdeveloped muscles leads toabsence of the reflex
10.Cough	Irritation of mucous membrane of larynx	Infant coughs	Birth	Persist lifelong	Enhances clearance of secretions and particulates from the airways and protects from aspiration of foreign materials	It is impaired for whose abdominals and respiratory muscles are weak.
11.Grasp	a. **Palmar Grasp** Touching/str oking palmsof hands b. **Plantar Grasp** Touching/str oking soles of feet near base ofdigits	Flexion ofhands. Flexion ofsoles.	Birth Birth	Palmar grasp at 3 months Planter grasp at 8 months	It allows a newborn to clench an object when pressure and touch are applied to the palm	Athetoid Cerebral palsy
12.Babins ki	Stroking outer sole offoot upward	The big toe bends back toward the top	Birth	1year	Indicates active neurological	If no movement, then

	from heel across ball of foot	of the foot and the other toes fan out			responses Indicates brain and nerve activities are normal	its a neutral response and has no clinical significance.
13.Moro or Startle	In Birth 3-4 months, the baby throws back his or her	In Birth 3-4 months, the baby throws back his or her head, stretches his or her arms and legs, cries, and then draws the arms and legs in back in	Birth	3-4months	It helps babies to develop the controlled skill of walking	Generalized depression of CNS, hemi paresis, Erb palsy, Fracture clavicle, Kernecterus
14.Tonic neck or Fencing	a.Assymetrical Passive rotation of head in supine position b. Symmetri cal Passive extension of head in prone position	Extension of the same side's upper limb and flexion of the opposite side's upperlimb Extension of both upper limb& flexion of both lowerlimb	At birth 3 months	3 months 6 months	It helps your newborn to discover their hands and develop hand-eye coordination It helps your newborn to discover their hands and develop hand-eye coordination.	Spastic Cerebralpalsy Cerebral palsy
15.Galant or	Stroking infant back	Hip move towards	At Birth	4weeks	Its purpose is to encourage	The lack of a reflex may

Trunk incurvation	alongside spine	stimulated side			movement and develop range of motion in the hip in preparation for walking and crawling.	indicate spinal cord immaturity.
16.Dance or stepping or walking	If infant is held such that sole of foot touches a hard surface	There is reciprocal flexion and extension of legs	At Birth	3-4weeks	It prepares a child to walk, and it recurs around 12 months	The complete absence of the stepping reflex in infants, as well as its persistence after 4 months, may be due to a variety of factors, including motor nerve damage and significant neurological deficit after birth.
17.Crawl	When placed on abdomen	Infant makes crawling movement	Birth	4weeks	Important sign of nervous system development and function.	The lack of this reflex in a newborn is a warning sign of underlying neurological injury.

18.Parachute	Holding the child in ventral suspension and suddenly lowering him to the couch	Arms extend as a defensive reaction	6-9 months	Does not disappear	Parachute reflex will help keep baby from getting seriously hurt.	A symmetrical in spastic hemiplegia. Absent or abnormal in children with cerebral palsy
19.Landau	In the prone position, the baby is placed horizontally in the air.	Head elevated and legs slightly flexed in a convex arc.	3 months	12-24 months	This ability develops the gross motor cooperation and coordination between the top and bottom, and front and back of the body system.	Hypotonia, hypertonia, and behavioural abnormalities may all cause a lack of reflex.

DISCUSSION

Neonatal reflexes are an important part to both physical and adaptive functioning. These involuntary movements are often good predictors of motor and sensory development. When an infant displays weak or absent reflex responses, spinal cord, nerve, or muscular damage may be present. Furthermore, reflexes that persist beyond a certain age may also infer damage to the brain or nervous system. The overall importance of primitive reflexes in relation to motor functioning and development is to better understand and identify normal versus abnormal nervous system function. Reflexes help the Pediatrician to identify whether the child is normal or not. There are some reflexes like cry, sucking, rooting which hold the survival values. The abnormality in these reflexes should not to be avoided. The most important reflex is the cry reflex which brings the baby to the doctor.

CONCLUSION

Newborn reflexes form the foundation for future growth in the first moments and even months of life. Movement that begins as a reflex quickly transforms into conscious, cognitive, and physical activity.[10] A reflex's existence and strength are essential indicators of nervous system development and function. Knowledge of neonatal reflexes is important for understanding the human development as a whole, application of overall assessment of baby, recognition of possible neurodevelopmental damage, establishment of prognosis for future and predicting the child's future potential.

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