

Primitive Reflexes

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Definition/Introduction

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]

Primitive oral reflexes include sucking, rooting, and snout reflexes. The sucking reflex is important for coordination with breathing and swallowing.[1] It is observed when the oral region is stimulated or an object is inserted into the mouth and is first seen at 14 weeks gestation. The snout reflex is when the lips pucker after pressure on the upper lip. The rooting reflex, mouth turning toward an object, is seen in response to light stroking on the cheek or bringing an object into the patient's visual field. Rooting begins at 32 weeks gestation and decreases after one month.[3][4]

The palmomental reflex involves puckering of skin on the ipsilateral side and brief contraction of the mentalis muscle after brisk stroking of the patient's palm. Glabellar tap reflex occurs in response to repeated tapping of the patient's head between eyebrows, which elicits blinking that normally would disappear after 4 to 5 taps. This test should be performed from above and behind the patient to remove visual stimuli. This reflex is thought to be an adaptive response to protect newborn eyes from injury.[5]

The asymmetric tonic neck reflex is performed by manual rotation of the infant's head to one side. The infant will extend its arm to the side of the rotated face and flex the contralateral arm. Onset at 35 weeks gestation and disappears by three months.[6]

The Moro reflex is a protective response to the abrupt disruption of body balance and is elicited by pulling up on the arms with an infant in the supine position.[1] The infant experiences the sensation of falling when the arms are released, resulting in abduction at the shoulder and extension at the elbow with the spreading of the fingers, followed by immediate flexion of the upper extremities and an audible cry. The reflex develops by 28 weeks gestation and disappears by six months.[4][6]

The grasping reflex can be elicited by providing sustained pressure on the palmar aspect of the hand, resulting in flexion of the patient's fingers grasping the object providing the pressure. This reflex develops by 28 weeks gestation and disappears by six months.[3][4][6] The Babinski reflex involves the stimulation of the lateral foot resulting in dorsiflexion of the great toe and fanning of the other toes.[6][7][8]

Issues of Concern

Primitive reflexes are necessary for newborn survival, and abnormal reflexes can be a sign of central nervous system dysfunction.[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.[5][6][9] These may be seen in the normal adult but require further exploration if pathology is suspected.

Clinical Significance

Infants

Primitive reflexes are important in the newborn neurological examination. An absent or abnormal sucking reflex is an indirect indicator of neurological maturity in newborn infants. When an abnormal sucking reflex is associated with other signs of CNS involvement, it suggests basal ganglia or brainstem dysfunction. 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.[10][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.[4] 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.[11] The presence of 5 or more abnormal reflexes correlated with the development of cerebral palsy or mental delays.[6]

Adults

Primitive reflexes, also known as frontal release signs, can be normal in the adult population. Multiple frontal release signs observed on neurological examination correlate with frontal lobe brain pathology, including Alzheimer disease, multiple sclerosis, and schizophrenia.[9][6][5] Patients with schizophrenia were found to have more frontal release signs than their unaffected siblings and the control group.[9] In a 2005 study, researchers detected grasp and Babinski reflex responses in patients with dementia.[5] A present Babinski reflex is important in evaluating a suspected pyramidal tract lesion and is an upper motor neuron damage sign.[8][6] The reappearance of the grasp reflex has been associated with frontal lobe lesions and can be an early sign in corticobasal syndrome, Lewy body dementia, and progressive supranuclear palsy.[2][3] The glabellar tap and palmomental reflexes can be seen as an early sign of Parkinsonian disorders as well.[12] The presence of primitive oral reflexes must be distinguished from tardive dyskinesia in patients exposed to neuroleptics. The sucking and rooting reflexes may indicate diffuse cerebral atrophy, while the snout reflex suggests a frontal lobe lesion.[3]

Nursing, Allied Health, and Interprofessional Team Interventions

Oral primitive reflexes are necessary for newborn feeding. Lactation specialists and neonatal nurses should understand these reflexes to help identify early problems with infant feeding.[1] The nursing staff needs to be aware of the reappearance of primitive reflexes in the elderly population. The sucking and snout reflexes were associated with an increased risk of malnutrition in nursing home residents and put them at greater risk of aspiration pneumonia.[13]

Review Questions

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References

1. Sohn M, Ahn Y, Lee S. Assessment of Primitive Reflexes in High-risk Newborns. *J Clin Med Res*. 2011 Dec;3(6):285-90. [PMC free article: [PMC3279472](#)] [PubMed: [22393339](#)]
2. Mestre T, Lang AE. The grasp reflex: a symptom in need of treatment. *Mov Disord*. 2010 Nov 15;25(15):2479-85. [PubMed: [20848621](#)]
3. Schott JM, Rossor MN. The grasp and other primitive reflexes. *J Neurol Neurosurg Psychiatry*. 2003 May;74(5):558-60. [PMC free article: [PMC1738455](#)] [PubMed: [12700289](#)]
4. Edwards CW, Al Khalili Y. StatPearls [Internet]. StatPearls Publishing; Treasure Island (FL): Jul 25, 2023. Moro Reflex. [PubMed: [31194330](#)]
5. Damasceno A, Delicio AM, Mazo DF, Zullo JF, Scherer P, Ng RT, Damasceno BP. Primitive reflexes and cognitive function. *Arq Neuropsiquiatr*. 2005 Sep;63(3A):577-82. [PubMed: [16172703](#)]
6. Zafeiriou DI. Primitive reflexes and postural reactions in the neurodevelopmental examination. *Pediatr Neurol*. 2004 Jul;31(1):1-8. [PubMed: [15246484](#)]
7. Acharya AB, Jamil RT, Dewey JJ. StatPearls [Internet]. StatPearls Publishing; Treasure Island (FL): Jan 1, 2023. Babinski Reflex. [PubMed: [30085551](#)]
8. Ambesh P, Paliwal VK, Shetty V, Kamholz S. The Babinski Sign: A comprehensive review. *J Neurol Sci*. 2017 Jan 15;372:477-481. [PubMed: [27823832](#)]
9. Hyde TM, Goldberg TE, Egan MF, Lener MC, Weinberger DR. Frontal release signs and cognition in people with schizophrenia, their siblings and healthy controls. *Br J Psychiatry*. 2007 Aug;191:120-5. [PubMed: [17666495](#)]
10. Mercuri E, Ricci D, Pane M, Baranello G. The neurological examination of the newborn baby. *Early Hum Dev*. 2005 Dec;81(12):947-56. [PubMed: [16274943](#)]
11. Garfinkle J, Li P, Boychuck Z, Bussi eres A, Majnemer A. Early Clinical Features of Cerebral Palsy in Children Without Perinatal Risk Factors: A Scoping Review. *Pediatr Neurol*. 2020 Jan;102:56-61. [PubMed: [31416726](#)]
12. Brodsky H, Dat Vuong K, Thomas M, Jankovic J. Glabellar and palmomental reflexes in Parkinsonian disorders. *Neurology*. 2004 Sep 28;63(6):1096-8. [PubMed: [15452308](#)]
13. Hobo K, Kawase J, Tamura F, Groher M, Kikutani T, Sunakawa H. Effects of the reappearance of primitive reflexes on eating function and prognosis. *Geriatr Gerontol Int*. 2014 Jan;14(1):190-7. [PubMed: [23992100](#)]

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