Article

Retained primitive reflexes in children, clinical implications and targeted home-based interventions

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Authors:

Miyuru Chandradasa
University of Kelaniya

Layani C Rathnayake
Ministry of Health, Sri Lanka

Abstract

This article discusses problems such as learning difficulties and behavioural problems that children may experience when they have retained primitive reflexes, which are typically only present in the first few months of life. The authors outline different types of primitive reflex present in infants and how each may affect a child when retained beyond the time when they are normally inhibited. Where relevant health professionals with expertise in this area are not available, children's nurses may need to assess and manage children with retained reflexes. This article explains how a nurse can assess a child for each primitive reflex and describes exercises that can be taught to a child and his or her parents to carry out at home to reintegrate the reflex.

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... • passive sensory stimulation in the form of tactile, olfactory, visual and auditory stimulation (Woo et al., 2015); for example, auditory stimulation involved wearing a clip-on metronome to hear a rhythmic tone; • exercises targeting primitive and postural reflexes (Chandradasa & Rathnayake, 2020) , which were assigned based on indicators of a retained reflex at the time of the initial assessment; • core muscle exercises to engage abdominal muscles, lateral core muscles and back muscles (Myer et al., 2011); • proprioceptive and balance training, using a rocker board and one-leg balance (Fong et al., 2016;Kobel et al., 2020); • gait exercises, using the cross-crawl march (Surburg & Eason, 1999) and jump rope (Trecroci et al., 2015); • fine motor activities, including the palmar grasp reflex to increase muscle strength and the Purdue Peg Board to improve dexterity and speed, which involves using fingers to place small pegs into a board with 25 holes (Squillace et al., 2015); • rhythm and timing exercises using Rhythmicity (UCSF Neuroscape, San Francisco, CA), a tablet-based game designed to assess sensorimotor synchronization ability with auditory, visual and/or tactile stimuli (Johnson et al., 2020); • activities that aim to enhance auditory and visual processing, as well as coordination and endurance of eye movements (Fisher et al., 2015;Robert et al., 2014). More specifically, auditory engagement consisted of exposure to varying levels of auditory stimulation and activities targeting the ability to filter and rapidly process auditory information. ...

... Before and after Brain Balance participation, students were assessed for eight primitive reflexes including the asymmetric tonic neck reflex, Landau reflex, Moro reflex, palmar reflex, rooting reflex, spinal galant reflex, symmetric tonic neck reflex and tonic labyrinthine head reflex (Chandradasa & Rathnayake, 2020) . Students were scored on a scale from zero to four, with zero indicating a complete absence of the reflex and four indicating a strong reflex reminiscent of what would be observed in infants. ...

... Previous studies have reported significantly higher levels of primitive reflex retention in school-aged children with ADHD symptoms compared with typically developing peers (Bob et al., 2021;Konicarova et al., 2013;Sigafoos et al., 2021;Taylor et al., 2004). Retained primitive reflexes have also been associated with deficits in multiple other developmental areas, including delayed motor development (Gieysztor et al., 2018), reading deficits (McPhillips & Sheehy, 2004) and learning difficulties (Chandradasa & Rathnayake, 2020) , and could be an early indicator of neurodevelopmental conditions (Chinello et al., 2018;Sigafoos et al., 2021;Teitelbaum et al., 2004). Our finding that five of eight primitive reflexes were significantly diminished after completion of the Brain Balance programme suggests that sensory stimulation and motor skills exercises, particularly those that target the primitive reflexes directly, are sufficient to reduce the strength of retained primitive reflexes in students with developmental difficulties. ...

The Brain Balance® programme improves attention and classroom behaviour in students with attentional and developmental challenges in a school setting (El programa Brain Balance® mejora la

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... As sensory motor skills and primitive reflexes can provide additional valuable information about a child's development (Cameron et al., 2016;Geertsen et al., 2016; Chandradasa and Rathnayake, 2020) , we also assessed sensory motor skills and atypical retention of primitive reflexes across different age groups from pre-to post-participation in the Brain Balance program (see the Methods section for details on these assessments). Here, we show significant improvements in five areas of sensory motor skills and integration of eight different primitive reflexes following Brain Balance participation. ...

... Before and after BB participation, students were assessed for primitive reflexes including the asymmetric tonic neck reflex, Landau reflex, Moro reflex, palmar reflex, rooting reflex, spinal galant reflex, symmetric tonic neck reflex, and tonic labyrinthine head reflex (Chandradasa and Rathnayake, 2020) . Primitive reflexes were scored on a scale from 0 to 4, with 0 being no response, indicating that the reflex has been normally integrated, and a 4 being a significant response. ...

... • Exercises targeting primitive and postural reflexes (Chandradasa and Rathnayake, 2020) , which were assigned based on indicators of a retained reflex at the time of the initial assessment. The following reflexes were assessed: Moro reflex, spinal Galant reflex, rooting reflex, palmar grasp reflex, asymmetrical tonic neck reflex, symmetrical tonic neck reflex, tonic labyrinthine reflex, and Landau reflex; ...

Reliable change in developmental outcomes of Brain Balance participants stratified by baseline severity

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... Primární reflexy, se kterými se při fyziologickém vývoji rodíme, nám pomáhají v prvotních měsících života přežít a budovat motorické vzory vedoucí postupně až ke vzpřímenému stoji, rozvoji rovnováhy, koordinaci oko-ruka, anebo například k budování jemné a hrubé motoriky. Některé prameny pracují s termínem primitivní reflexy (Gieysztor, Choińska, & Paprocka-Borowicz, 2018; Chandradasa & Rathnayake, 2020; Zafeiriou, 2004), v našem příspěvku budeme dále užívat jednotně termín "primární reflexy". Reflexy jsou svalové reakce, které se projevují automaticky jako odpověď na specifický stimul, objevují se během vývoje plodu a jsou rozhodující pro přežití novorozence (Chinello, Di Gangi, & Valenza, 2018b). ...

... Inhibice primárních reflexů umožňuje rozvoj motorických dovedností, které dovolují kojenci interakci s okolním prostředím stále komplexnějším způsobem (Chinello et al., 2018b). Přetrvání primárních reflexů (či jejich znovuobjevení) mimo obvyklou dobu může být způsobeno poraněním mozku, například mozkovou obrnou či cévní mozkovou příhodou (Chandradasa & Rathnayake, 2020) nebo sníženou pohybovou aktivitou či zvýšenou nemocností, kdy během rekonvalescence je opět pohybová aktivita snížena (Goddard Blythe, 2005). Pokud se primární reflexy neinhibují, a jsou zachovány i po normálním vývojovém období, indikují neurologickou dysfunkci a mají potenciál narušit proces zrání či snížit schopnost mozku účinně zpracovávat senzorické informace (Callcott, 2012;Chinello et al., 2018b). ...

... Mohou se také podílet na vzniku specifických poruch učení -dyslexie, dysgrafie, dyspraxie, ADHD, ADD. Dítě s opožděným psychomotorickým vývojem může vykazovat potíže i při jízdě na kole, při běhu či házení a chytání, může se jevit jako nemotorné (Chandradasa & Rathnayake, 2020) . Volemanová (2013) uvádí, že primární reflexy mohou způsobit symptomy různých poruch učení. ...

The issue of persistent primary reflexes in primary school pupils

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... These more transient reflexes have been variously referred to as the primitive, neonatal, fetal, or developmental reflexes [10][11][12]. Table 1 describes a number of primitive reflexes that have been frequently reviewed in the medical and psychological literature [2, [10][11][12]. ...

... This article is part of the Topical Collection on Communication Disorders Perhaps the most unique and intriguing aspect of primitive reflexes is that they typically disappear, or are greatly diminished, within the first year or two of life [2] . It has been suggested that as the brain matures during infancy, primitive reflexes are increasingly inhibited and replaced by voluntary motor responses [13]. ...

... At least three possible intervention approaches could be envisioned: (a) preventing elicitation, (b) teaching individuals to inhibit their own reflex reactions, and/or (c) shaping existing reflex reactions into the service of a functional (voluntary) response. While each of these options has been mooted [2, 14,49], well-controlled intervention studies are lacking and could thus be seen as a priority area for future research. ...

Persistence of Primitive Reflexes in Developmental Disorders

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... ☐ Passive sensory stimulation in the form of tactile, olfactory, visual, and auditory stimulation [35]. ☐ Exercises targeting primitive and postural reflexes [36] . ☐ Core muscle exercises [37]. ...

... We next performed one-sample t-tests on difference scores for each group and cognitive test to identify which tests showed significant improvement (i.e., difference scores greater than zero); results are reported in Table 2. We found that 4-to 6-year-old BB participants improved on all three tests -Spatial Span (t (85) = 3.58, p unc < 0.001, p FDR < 0.005, d = 0.39), Feature Match (t (85) = 4.71, p unc < 0.001, p FDR < 0.001, d = 0.51), and Paired Associates (t (85) = 2.17, p unc < 0.05, p FDR < 0.05, d = 0.23) -whereas CTRL subjects improved only on Feature Match (t (36) ...

Effect of the Brain Balance Program® on Cognitive Performance in Children and Adolescents with Developmental and Attentional Issues

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... To achieve adequate reflex inhibition, the movements were to be repeated daily with improvements being understandably slow. The duration of the exercises is variable and varies depending on the age of each patient (Chandradasa & Rathnayake, 2020) . Once the therapist concluded that the inhibition treatment had come to an end, an Optometrist retested the patient with the Visagraph TM III. ...

Persistence of primitive reflexes associated with asymmetries in fixation and ocular motility values

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... However, the observed improvement in motor coordination is not independent of the reflex profile because primitive reflexes result in involuntary motor responses that affect the quality of motor skills (Bilbilaj et al., 2017; Chandradasa & Rathnayake, 2020) . The problem is further exacerbated if the child moves little or is exposed to poor quality and quantity of movement (Doidge, 2009). ...

The Efficacy of the Sensorimotor Training Program on Sensorimotor Development, Auditory and Visual Skills of Schoolchildren Aged 5–8 Years

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... The early indications of ASD may include delayed asymmetry of rolling over around 3-5 months of age, as well as the inability to latch on and breastfeed, which is frequently found in children with developmental delays [22,23]. Therapists recommend specific exercises that are thought to stimulate or reproduce primitive reflexes to remediate various neurobehavioral disorders [24, 25]. ...

Anatomic and Functional Connectivity Relationship in Autistic Children (P3.316)

Article

Apr 2018

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... The early indications of ASD may include delayed asymmetry of rolling over around 3-5 months of age, as well as the inability to latch on and breastfeed, which is frequently found in children with developmental delays [22,23]. Therapists recommend specific exercises that are thought to stimulate or reproduce primitive reflexes to remediate various neurobehavioral disorders [24, 25]. ...

The Relationship between Retained Primitive Reflexes and Hemispheric Connectivity in Autism Spectrum Disorders

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Jul 2023 · BSRCCS

Robert Melillo · Gerry Leisman · Calixto Machado · Eli Carmeli

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... The early indications of ASD may include delayed asymmetry of rolling over around 3-5 months of age, as well as the inability to latch on and breastfeed, which is frequently found in children with developmental delays [22,23]. Therapists recommend specific exercises that are thought to stimulate or reproduce primitive reflexes to remediate various neurobehavioral disorders [24, 25]. ...

The Relationship between Retained Primitive Reflexes and Hemispheric Connectivity in Autism Spectrum Disorders

Preprint

Jun 2023

Robert Melillo · Gerry Leisman · Calixto Machado · Eli Carmeli

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... The fact that reflexes are active in neurotypical population may be because during the first year of life, key developmental movements have not been frequently repeated-therefore, the synaptic reorganization of the motor map necessary for integration has not occurred (Kleim et al., 2002). Stress during pregnancy or maternal illness, as well as chronic stress, illness, trauma, or injury to the infant, may also cause reflexes not to be inhibited (Chandradasa & Rathnayake, 2020) . Due to some of these reasons, the reflex remains active and is expressed in the presence of a stimulus that elicits it (Blythe, 2002). ...

Effect of a psychoeducational intervention on motor and perceptual-visual development through the inhibition of primitive reflexes in schoolchildren aged 4 to 7 years old

Article

Jun 2023

Lidia Infante-Cañete · Beatriz Aguilar-Guerrero · Agustin Wallace

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... El hecho de que los reflejos estén activos en población neurotípica puede ser debido a que en el primer año de vida no se han repetido de forma frecuente movimientos claves del desarrollo y, por tanto, la reorganización sináptica del mapa motor necesaria para la integración no se ha producido (Kleim et al., 2002). El estrés durante el embarazo o enfermedad de la madre, así como el estrés crónico, enfermedad, trauma, o lesión en el bebé son otras posibles causas que pueden hacer que los reflejos no sean inhibidos (Chandradasa y Rathnayake, 2020) . Debido a alguna de estas razones, el reflejo permanece activo y se expresa ante la presencia de un estímulo que lo evoca (Blythe, 2002). ...

Efecto de una intervención psicoeducativa en el desarrollo motor y perceptivo-visual a través de la inhibición de los reflejos primitivos en escolares de 4 a 7 años

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... Persistent reflex activity can influence the quality of a child's motor skills, especially coordination and balance. They may be linked to learning difficulties and behavioral problems [9, 10]. Incomplete integration of primitive reflexes may cause an involuntary motor response in a reflex pattern. ...

Primitive Reflex Activity in Relation to Motor Skills in Healthy Preschool Children

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Retained Primitive Reflexes and Potential for Intervention in Autistic Spectrum Disorders

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