

RESEARCH NEWS

NEUROLOGICAL DYSFUNCTION AS A SIGNIFICANT FACTOR IN CHILDREN WITH DYSLEXIA

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A study of 54 children who had previously been given an independent diagnosis of dyslexia, revealed that they all showed evidence of immature motor skills and related visual processing problems on a range of standardized neurological tests. The findings suggest that physical factors play a significant role in some children diagnosed with dyslexia.

It is an accepted medical fact that primitive reflexes should not persist above 6 months of age (12 months at the latest), and that postural reflexes should be fully developed by 3 ½ years of age. Abnormalities in an individual's profile of primitive and postural reflexes at a later age provide reliable diagnostic signposts of central nervous system immaturity.

A sample of 54 children aged 8 to 15 years who had previously received a diagnosis of dyslexia were examined for the presence of primitive and postural reflexes. An historical control was assumed on the basis of the accepted medical premise that primitive reflexes should not be present above 6 months of age and that postural reflexes should be developed by three and a half years of age. Additional tests were carried out to assess oculo motor functioning (control of eye movements), visual-perceptual performance, cerebellar involvement and dysdiadochokinesia (difficulty with rapid alternate movements).

Abnormal primitive and postural reflexes were found to be a significant underlying factor in this sample. The asymmetrical tonic neck (ATNR) and tonic labyrinthine (TLR) reflexes were present in 100% of the sample. Both of these reflexes have a direct affect upon the functioning of the vestibular system (balance mechanism) and its connections to the centers that control eye movements. Other reflexes found to be significant were:

- ③ The symmetrical tonic neck reflex, the spinal galant reflex, palmar, plantar and rooting reflexes.
- ③ Postural reflexes were also under-developed.
- ③ 53% showed some signs of cerebellar involvement and 85% had difficulty with at least one of the tests for dysdiadochokinesia indicating poorly developed bilateral integration.
- ③ 92% of the sample demonstrated difficulties with oculo-motor skills, of which:
 - 74% had difficulty with tracking (visual-pursuit)
 - 83% had difficulty with hand-eye tracking
 - 59% had difficulty with near-point convergence (necessary to fuse the two separate images seen by each eye to send a single unified image to the brain)
 - 59% had delayed re-establishment of binocular vision.

Visual-perceptual difficulties were also present:

- ③ 44% had difficulty with visual discrimination
- ③ 81% showed evidence of stimulus bound effect
- ③ 98% had difficulty with visual-motor integration coordination

The results suggest that whilst individual reflex abnormalities impair functioning in specific skills, the combined effect of a cluster of abnormal reflexes can have an impact upon learning in general, particularly those areas of learning which require cooperation with the motor system. Reading may be affected because it requires a level of oculo-motor functioning. Writing is a motor task that depends upon coordination of the hands and the eyes with automatic support from the postural system. Lack of automatization in the acquisition of motor related skills can then affect

performance on written language and other motor dependent skills.

Two recent studies have demonstrated improvements in reading (McPhillips, Hepper and Mulhern¹) and in eye movements (Bein-Wierzbinski²) as a result of specific reflex stimulation and inhibition movements. The results of this study suggest that abnormal reflexes not only provide evidence of neurological dysfunction but also affect the functioning of the vestibular-ocular reflex arc (VOR) resulting in abnormal eye movements and visual-perceptual difficulties, both of which are often features of Dyslexia.

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References

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