ACQUIRED BRAIN INJURY

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Pathophysiology

Acquired brain injury (ABI) refers to any type of brain damage that occurs after birth. There are 7 causes of ABI including: tumours – benign or cancerous (gradual), trauma – acceleration/deceleration injuries, penetrating injuries (sudden), stroke-blocked vessel, bleeding from the brain (sudden), hypoxia/anoxia – lack of oxygen (sudden), alcohol related and other toxins (gradual), infection – leading to inflammation (sudden), and degenerative diseases – MS, Huntington, Parkinson's, Alzheimer's disease (gradual).

Impairments

ABI patients may suffer from cognitive, physical, behavioural, social and mental health impairments. 50% of ABI patients suffer clinical depression and struggle to cope with and/or maintain employment. Cognitive impairments affect nearly all people with ABI and can disturb to memory, attention and arousal (e.g, fatigue and distractibility), language and communication (e.g. dysnomia and difficulty with high-level receptive and expressive language), and planning and organisation (e.g. goal setting and scheduling). Physical impairments can cause strength deficiencies, hypertonia, contracture, ataxia and pain. While behavioural impairments may cause a lack of acceptable social restraint, impulsivity, reduced insight and egocentricity. These impairments frequently have significant social consequences and cause difficulty forming and maintaining close personal relationships and family disruption. The outcome of a given injury depends largely upon the severity of the initial injury and appropriate treatment plays a vital role in determining the level of recovery.

BENEFITS OF EXERCISE

People with ABI are among the most physically inactive members of society, and, those with severe brain impairments are less active than those with mild to moderate impairments. This physical inactivity is harmful for health, fitness and function, and compounds the primary impairments resulting from ABI. Exercise also improves depressive symptoms, mood, global cognition, selective attention, working memory and therefore quality of life. Specific and appropriate exercise improves altered joint mechanics and muscle impairments seen in patients with hypertonia. There is also emerging evidence that aerobic exercise may confer cognitive benefits and that exercise in group settings can assist community re-entry by providing opportunities for development of social skills and interaction.

Exercise Prescription

There is strong scientific evidence to indicate that exercise prescription remains similar to those in the healthy population. As per the national physical activity guidelines, 150-300 minutes of moderate-vigorous exercise per week, including aerobic and resistance based exercise. This needs to include regular functional exercise to improve performance on those tasks (e.g., ease of sit-to stand, walking speed or walking duration). While exercise prescription totals are similar to the healthy population, exercise must be specific to the patients medical history and goals, as often there are additional musculoskeletal issues and cognitive impairments making prescription more complex.

References

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