

Fatigue

Fatigue is often reported to be the most common and debilitating symptom of PPS^{42,70,79,80} and has been reported by 48⁷¹ to 87⁷⁰ percent of subjects in previous surveys of LEOP. In the Queensland study by Lynch (2000)⁷⁴ 79 percent of subjects reported new symptoms of fatigue.

In two national surveys of American polio survivors, 91 percent reported new or increased fatigue, 41 percent reported fatigue significantly interfering with performing or completing their work and 25 percent reported fatigue interfering with self-care activities.^{81,82} Fatigue was reported to be triggered or exacerbated by physical overexertion in 92 percent and by emotional stress in 61 percent of study participants.

Post-polio fatigue appears to occur in two forms:

General Fatigue

General (central) fatigue has been described as an overwhelming exhaustion with flu-like aching and a marked change in the level of energy, physical and mental endurance following minimal activity. A common description of general fatigue, coined by Halstead and colleagues in 1985,⁴⁸ is that of the “polio wall”, a sudden feeling of overwhelming exhaustion. This sudden onset of symptoms includes intense fatigue, weakness, hot and cold flushes, and sweating. Commonly it occurs late in the afternoon or early evening and is typically brought on by an accumulation of activities that previously did not require special effort or cause noticeable sequelae.

Contributing causes of general fatigue may include:⁸³⁻⁸⁶

- Chronic pain;
- Respiratory compromise;
- Depression;
- Sleep disorders;
- Dysfunction of the reticular activating system; and
- Type A behaviour.

Fatigue can affect mental as well as physical function. Between 70 and 90 percent of American polio survivors with fatigue reported problems with concentration, memory, attention, word finding, maintaining wakefulness and clear thinking. In 77 percent of these individuals the cognitive difficulties were described as moderate to severe.⁹ Despite these multiple cognitive complaints, the only significant deficits that have been observed on formal neuropsychological testing in severely fatigued post-polio subjects were in the areas of attention and information processing speed.^{87,88}

Cognitive problems reported by people with a history of polio suggest that the fatigue experienced cannot be explained merely by damage to the anterior horn motor neurons.⁸⁹ Bruno and colleagues (1991)⁹ have suggested that the emergence of fatigue decades after acute polio may result from normal age related changes and the loss of brain activating system neurons that had survived the acute polio

infection, combined with an already decreased number of neurons as a result of the original poliovirus infection. During the acute illness, subjects often reported symptoms of drowsiness, lethargy, fatigue and poor attention, similar to the symptoms that they are now experiencing.¹¹ The loss of brain activating system neurons would decrease cortical activation, reduce attention and produce the symptoms of fatigue experienced by post-polio survivors.⁸⁸

Previous research has indicated that the poliovirus often damaged brain areas responsible for cortical activation and attention, including the reticular formation, posterior hypothalamus and thalamus as well as the putamen, caudate, locus ceruleus and substantia nigra.¹⁰ Reduction of neurotransmitters, in particular dopamine, due to damage to the substantia nigra, may impair the individual's ability to activate the cortex, resulting in difficulties with attention, concentration and maintaining wakefulness.

Muscle Fatigue

Muscle (peripheral) fatigue is reported as a decline in muscle strength upon exertion, which may be best described as muscle fatiguability or lack of endurance. Post-polio individuals have described muscle fatigue as “a heavy sensation in the muscles,” “increased physical weakness,” and an “increased loss of strength during exercise.”⁹⁰ Muscle strength usually returns after a period of rest.

Contributing causes for muscular fatigue may include:^{91,92}

- Overuse myopathy;
- Muscle fibre type disproportion;
- Defective muscular function; and
- Neuromuscular junction transmission defects.