
New Evidence in the Theories Behind Phantom Limb Pain: A Systematic Review of the Literature, 2015-2020

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BACKGROUND

At the time of this review, there is no consistently reliable treatment option for phantom limb pain in those with limb-loss. Critical stages in pain signal transfers and processing are analysed; how the body alters internally following amputation may provide a key insight into the underlying cause of phantom limb pain. Recent advantages in neuroimaging techniques and a plethora of insufficient treatment options preceding 2015 highlight further gaps in the knowledge of this complex condition.

AIM

To outline the most recent developments in understanding the phantom limb pain phenomenon and offer a new insight into how this new evidence intertwines with older theories.

METHOD

Four electronic research databases were searched in October of 2020 using a combination of keywords and Boolean operators; non-English and data pertaining to animal testing were excluded, as were studies focusing on non-painful phantom sensations. Papers were appraised using the SIGN grading system and papers scoring a quality grade poorer than 2+ were excluded.

RESULTS

Twenty-five articles were included within the review. The papers used a mixture of collection methods such as questionnaire and fMRI to obtain data from a total of 737 subjects. A number of overlapping themes were evident including the maladaptive plasticity and neuromatrix models, the pain memory theory and psychological factors, sensitised nervous systems, and phantom limb ownership.

DISCUSSION AND CONCLUSION

Phantom limb ownership plays a larger part in the pain experience than previously considered; phantom pain severity is affected by multiple factors thus several patient-specific treatments must be explored. Phantom limb pain strongly correlates with the ability to move and control the phantom limb; multiple systemic malfunctions or changes following amputation are thought to be at fault. Ownership of the limb is essential for successful rehabilitation; further evidence is required to confirm additional theories.
