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Original Paper

## Effects of Acetyl-*DL*-Leucine in Vestibular Patients: A Clinical Study following Neurotomy and Labyrinthectomy

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**Key Words**

- Balance control
- Acetyl-*DL*-leucine
- Vertigo crisis
- Vestibular nucleus

**Abstract**

For 40 years, the amino acid acetyl-*DL*-leucine (or isoleucine – Tanganil®) has been used in clinical practice to reduce imbalance and autonomic manifestations associated with acute vertigo crises. In animal models, acetyl-*DL*-leucine accelerates vestibular compensation following unilateral labyrinthectomy, and has only minor effects on normal vestibular function. Our work in animal models suggested that acetyl-*DL*-leucine acted mainly on abnormally hyperpolarized and/or depolarized vestibular neurons by restoring their membrane potential towards a mean value of –65 to –60 mV. Acute vestibular disorders are associated with asymmetrical spontaneous activities of vestibular neurons, so this previous study suggested that acetyl-*DL*-leucine may reduce acute, vestibular-related imbalances in humans. To test this hypothesis, we investigated the efficacy of acetyl-*DL*-leucine during the acute stage following neurotomy or labyrinthectomy in patients undergoing surgery for unilateral vestibular acoustic neurinoma, or suffering from unilateral and intractable Ménière's disease. By clinical testing of the vestibular function, patients were categorized according to the degree of compensation of the vestibular deafferentation prior to surgery. For patients who had achieved a close to perfect compensation before surgery, acetyl-*DL*-leucine had minor or no effect after surgery. For patients who displayed residual vestibular function before surgery, acetyl-*DL*-leucine eased the static vestibular syndromes, which followed neurotomy. Our findings tend to confirm the view that acetyl-*DL*-leucine mainly acts, in humans, on abnormally hyperpolarized and/or depolarized vestibular neurons by restoring their membrane potential towards normal values; this is consistent with findings in guinea pigs following unilateral labyrinthectomy. Moreover, it suggests that the degree of caloric paresis of the patients before neurotomy is useful both to predict the outcome of any acute vestibular syndrome following neurotomy and to assess the potential value of the administration of acetyl-*DL*-leucine to treat any such syndrome.

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