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Developing an exercise intervention to minimise hip bone mineral density loss following traumatic lower limb amputation: a Delphi study

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What is the ADVANCE Study?

The ADVANCE Study investigates the physical and psycho-social outcomes of battlefield casualties in the long-term. The study includes 1,145 male participants who served in the armed forces and were deployed to the conflict in Afghanistan (2002-2014). Half of the cohort have sustained serious battlefield injuries, and the other half are the comparison group of non-injured servicemen.

What does this piece of ADVANCE research look at?

Previous ADVANCE research found those with lower limb amputations had reduced hip bone mineral density (BMD). Lower hip BMD increases the risk of a hip fracture. Exercise interventions have been shown to improve BMD in other populations, but this has not been evaluated in a population with lower limb amputation previously. Before implementing any intervention, it may be helpful to obtain expert opinion on an intervention prior to a large clinical trial. A Delphi process can be used to obtain a consensus in a group of experts. This study aimed to elicit expert opinion using the Delphi process and gain a consensus to define a viable exercise intervention to minimise hip BMD loss following traumatic lower limb amputation. To do this we provided experts with evidence-based statements regarding previous exercise interventions and the potential application to individuals following an amputation. We required a certain number of experts (>70%) to agree with a statement to gain a consensus.

What were the findings?

This Delphi process recruited 13 world leading experts and used three separate rounds of rating evidence-based statements regarding the exercise programme. All 13 experts completed rounds 1, 2 and 3 (100% completion). Round 1 excluded 12 statements and added 1 statement (11 statements for rounds 2–3).

Round 3 reached consensus on nine statements to guide future exercise interventions. Experts agreed that exercise interventions should be performed at least 2 days per week for a minimum of 6 months, including at least three different resistance exercises at an intensity of 8–12 repetitions. Interventions should include weight-bearing exercises and involve high-impact (hopping, jumping) activities and be supervised initially.

What do the findings mean?

This expert Delphi process achieved consensus on nine items related to exercise prescription to minimise hip BMD loss following traumatic lower limb amputation. These recommendations will be tested in a future feasibility trial to ensure this is acceptable to those with lower limb amputations, to ensure it is safe, and ensure we can recruit participants and that participants will adhere to the exercise programme. Consequently, we would plan to implement a full-scale clinical trial using this exercise programme to investigate if it can minimise bone mineral density loss after amputation and therefore, reduce lifelong fracture risk.

