

DISCUSSION

The aim of the study was to investigate whether more than 12 grip types and hand positions offered by a myoelectric hand might further reduce the difficulty of ADLs as shown for the Michelangelo hand with its 7 grips and hand positions.

Overall, the ease, usefulness and way of use of all three multigrip hands did not significantly differ compared to each other. Compared to conventional myoelectric hands, there was an overall improvement in ease and usefulness ratings and an increase in ADLs in which the multigrip hands were actively used to grasp. While Michelangelo showed moderate improvement in all but two ADLs, bebionic and i-limb showed considerable improvement for some ADLs but also substantial decline in ease and usefulness for some other ADLs. This suggests that there is no “perfect” posthetic hand and that clinicians must match the functional ADL needs of each patient with the hand that meets these specific needs best.

CONCLUSIONS

All multigrip myoelectric hands may reduce the difficulty for performing ADLs vs. conventional hands. However, the availability of more grip types in a hand does not necessarily result in greater ease of performance of ADLs and greater perceived usefulness in general. Interestingly, the 3 multigrip hands studied showed different activity profiles that they facilitate. For some activities, there was a clear advantage for some hands over others. Thus, clinicians’ knowledge of the patients’ functional needs and the differential features of all multigrip hands available on the market is crucial for selecting the best suitable hand for an individual patient. In addition, this study also highlights the need for more sophisticated control (e.g. pattern recognition) that facilitates easier and more intuitive access to a greater number of grips in a prosthetic hand than the current 2-channel myoelectric control.

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