CHOOSING BEST COMPONENTS FOR AN AMPUTEE.
A Methodology For The Best Decision-making

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BACKGROUND

The harmony between the stump and the prosthesis is critical to allow it to fulfill its function enabling an efficient gait. A well-fitted socket, with an efficient and comfortable suspension, allows the amputee to continue their daily living activities, maintaining the stump functional, making this correlation between socket and suspension very important in the functionality of the prosthesis, mobility and overall satisfaction with the device1,2. Of our knowledge, the quantitative correlation between all of these factors as not yet been assessed.

AIM

Verify and confirm the process of decision-making for four different trans-tibial prostheses with suspension systems: Hypobaric(A), PIN(B), Classic Suction(C) and Vacuum Active – VASS(D) according data provided by gait efficiency (ml/O2/kg/m) imagology (pistonning) and amputee perception

METHODS

For this case-study, with a 23 years old individual, the functional performance that each different suspension system allows was assessed with physiological data provided by:

• Gait efficiency (ml/O2/kg/m) from a breath-by-breath analyzer - Quark PFT Ergo – CMSMED in a treadmill H/P/Cosmos (R) Mercury according Lin-Chan (2003) in which a lower value is a better value.

• The pistonning measure (image of axial displacement of the stump in mm, was measured by indirect conversion of image amplification system model MultiPro/Top Siemens according Narita (1997)).

• Perception data was provided by Prosthesis Evaluation Questionnaire (PEQ)3. This will analyze the perception of the subject, as well as the functionality and the quality of life provided by each of the prostheses (component) tested.

RESULTS

Pistonning, showed better results for VASS with 47,91 mm. According amputee perception by the PEQ, the VASS presented the best scores in all the 9 validated scales.

DISCUSSION & CONCLUSION

The use of this protocol with several objective and subjective data as proven the best evidence for analyzing differences in results of various suspension systems, and it seems that this is a viable tool in the evaluation and decision-making process within a rehabilitation with a prosthesis. Also through the analysis of results was clear that the VASS suspension system is, for this case-study, the one that provides greater functionality and satisfaction.

REFERENCES

4. Smith J, Sarcinelli S, S. M, Sarcinelli S. Vacuum Active – VASS suspension system and data: Mechanical efficiency of the total active suction (TAS) bilateral prosthesis: comparison with the vacuum and bearing (VTB) transfemoral prosthesis. Prosthet Orthot Int. 2007;31(1):177–182