Persons with diabetes experience using gait-analysis and efficacy of offloading

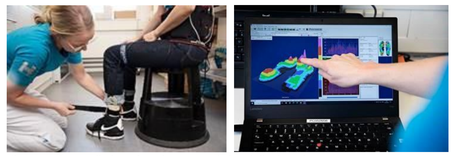
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BACKGROUND

All person with diabetes, with foot ulcers and deformities should be relieved with individually fitted insoles and footwear based on the person's gait. In order to prevent foot ulcers, it is important to assess and analyze the patient's gait in order to offer optimal relief on high spots on the feet. A gait-analysis is a qualitative and objective method of evaluate pressure, balance and settlement and is particularly suitable for analyzing persons with diabetes who have neuropathy.

AIM

The aim of this pilot study was to evaluate the educational guidance, and persons with diabetes ability to understand the importance of offloading, by using gait-analysis with sensor insoles and visualization on a computer screen.



Figur 1 & 2: Installation of equipment and visual display of pressure

METHOD

Twenty high risk persons with foot ulcer, previous foot ulcer or Charcot foot, was included. They walk 20 meters four times in prescribed footwear with costum insoles and terapeutic sandals, rigid rocker bottom with standart insoles (New Feet® Denmark). Elastic sensor insole Pedar X (Novel® Munich, Germany) was used to measure plantar pressure in both types of footwear. A high-risk area, Point of Interest (POI), on the persons feet was chosen for comparison. The person was guided using the visualization of plantar pressure in using footwear and offloading.

POI for both types of footwear was pointed out and the person was guided to the most optimal footwear.



Figur 3: A participant with equipment

Person's experience of the gait analysis and educational guidance was evaluated with short semi-structured interview after performing the gait-analysis and again one months after by phone.

Questions asked after the gait analysis
1) Did you feel that the gait analysis equipment influenced your gait during the analysis?
Yes ☐ No ☐
2) Was it usefull to see the pressure distribution on your feet on the computerscreen?
Yes ☐ No ☐
3) Is the educational guidance (related to use of insoles and recomanded footwear) more usefull after you have completed the gait analysis?
Yes ☐ No ☐

Questions asked after 1 month by phone
1) Have you changed you habits regarding using recomanded footwear or insoles?
Yes ☐ No ☐
2) Would you be interested to perform gait analysis again?
Yes ☐ No ☐

RESULTS

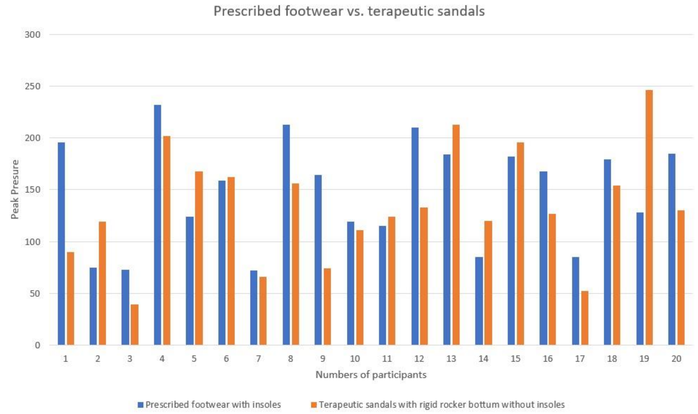
Based on POI showed that 13 persons (65%) were better offloaded in their prescribed footwear.

All persons expressed that the equipment didn't influence their gait during the analysis. The visualization of the pressure distribution provided a better understanding for plantart pressure. Everybody expressed that the educational guiding realated to offloading and recomanded footwear gave a better understanding after completing the gait-analysis.

After one mounth 18 person (90%) still had a more positiv approach toward the use of recomanded footwear and offloading.

Age	58,8 years
Diabetes type 2	11 (55%)
Gender	17 (85%) male
Diabetes duration	27,3 years
HbA1c	66 mmol
BMI	28,9 kg/m^2
Peripheral neuropathy >25 volt	20 volt (100%)
With foot ulcer	12 (12%)
Previous foot ulcer	16 (89%)
Charcot foot	7 (35%)
Toe-amputation	5 (25%)

Tabel 1: Diabetes related data was collected from our electronic patient record.



Tabel 2: The diagram shows the difference peak pressure POI in prescribed footwear with insole and therapeutic sandals with rigid rocker bottom without insoles

DISCUSSION AND CONCLUSION

The positive feedback from persons who participated in the gait-analysis and the attempt to visual show the plantart pressure in the educational guidens, showed that this could be useful for the future educational guidance in the daily footclinic.

I believe that there is a need to include more examination of the feet eg. joint test, to be able to provide the best guidence for offloading and footwear. There is also need for optimization in relations to who is guiding the person during the gaitanalysis and who is interviewing the person, if it is choosen to use semi-structured questions or interviews in the future.

This pilot study is the first part of our implementation of a new gait lab and provides an opportunity to evaluate and try to exspand our educational guidance with more visual info. We need to select which target groups will get the most out of gait analysis. Further investigations will be done in our center, with special focus om education and offloading.

References:
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