INTRODUCTION

EEG Electrodes have been used for decades with very little attention being paid to the design or shape of the electrode and its impact on skin safety and health. As a matter of fact, even in the past few years when more attention than ever is being paid to skin health, breakdown and injury, the electrode design continues to be relatively dismissed and reported to have less impact on skin breakdown than the technique in which the electrode is used. The objective is to illuminate the effect of EEG electrode design on skin health while controlling for application techniques and patient risk factors.

- The results indicate the type, shape, surface area and relative pressure of each electrode type does indicate impact on skin health for longer term EEG Electrode applications.
- These results lead to further conversations regarding patient-specific customization using a more than one EEG Electrode shape on a single patient to assist in the reduction of skin breakdown and skin injury issues.

RESULTS

1. Three different types of electrodes applied to the same subject using the same application technique, materials and technologist in an attempt to eliminate subjective differences involved in the application process.
   - Weaver NuPrep™ used to prep the skin
   - Weaver Ten20™ used as the conductive material
   - Mavidon™ Ccolodion used as the adhesive with gauze
   - Impedances recorded only at initial application- all were between 2K-5K Ohms.
   - All electrodes were Rhythmlink disposable EEG Electrodes

Electrodes (Deep Cup, Slim Cup, Webb™) applied for cont. 74 hours on left forearm with each electrode 1.5 inches apart

2. Document 1) surface area, 2) force to hold electrode to scalp, and 3) relative pressure by electrode type

METHODS

1. Applied three different types of electrodes on the same subject skin area, by the same technologist, using the same application materials and technique.
2. The Deep Cup style with the thinner (smaller surface area) rim showed visible skin changes versus the slim (larger surface area) and the flat Webb™ (largest surface area) which had little or no visible identification after removal.
3. Surface area and relative pressure were linked with the smaller surface area having the highest relative pressure.

CONCLUSIONS

- Surface area and relative pressure were related with the smallest surface area reporting the highest relative pressure and the largest surfaced area reporting the lowest relative pressure when applied to the skin.
- Deep Cup has the smallest surface areas (rim) in contact with the skin and is the highest relative skin pressure.
- Webb™ and PressOn™ apply the least amount of relative pressure when applied to the skin.
- The data indicates the shape of a traditional style Deep Cup may increase risks for skin challenges/issues due to the small surface area and high relative pressure when applied.
- A larger patient study would assist to provide more significant conclusions.

REFERENCES


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