



PREPARATION AND EVALUATION OF PILOCARPINE IONTOPHORETIC DISC FOR SWEAT TEST

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Abstract

The Quantitative Pilocarpine Iontophoretic Test (QPIT) is the reference assay for the diagnosis of Cystic Fibrosis. In this work we aimed to prepare disc of pilocarpine and to evaluate their efficiency in sweat induction as an alternative to pilocarpine solution.

Method: Disc containing 0.5% of pilocarpine chlorhydrate was made with agar-agar gel. The disc dimensions were 26 ± 1 mm in diameter and 3.5 ± 0.5 mm in thickness. Sweating was stimulated with an electric current of 1.5 mA for 5 min using an iontophoretic apparatus ELION 255. The pilocarpine discs were placed directly on both electrodes. While, the pilocarpine solution and a sulfuric acid 0.04N solution were placed respectively on the anode and the cathode. The two electrodes were placed at distance of 20cm on the inner face of forearms of two adult volunteers. Once sweat was induced; the samples were collected on filter paper during 30 min. Each sample weighing less than 75 mg was considered as failure [1].

Results : No failure has been registered for both solution and disc of pilocarpine. All sweat weights were equal to or greater than 110 mg. The volunteers did not report any burns or pain during either application. However, slight tingling and transient redness were observed with the pilocarpine disc.

Conclusion : Pilocarpine gel discs are easy to prepare, stable, and could be a good alternative to the conventional method. However, this preliminary result should be confirmed with a larger sample of volunteers.

Key Words : chlorine, cystic fibrosis, iontophoresis, pilogel, QPIT

1-Introduction

Cystic fibrosis is a rare disease caused by genetic mutation of the CFTR protein. The diagnosis relies on sweat chloride titration performed using the Shall & Shall assay. In 1952, Gibson & Cook applied the iontophoretic transport of pilocarpine through the skin to induce physiologic sweat and developed the Quantitative Pilocarpine Iontophoretic Test "QPIT" which is actually the gold standard of cystic fibrosis diagnosis [1,2].

Unfortunately, this method presents some inconveniences such : insufficient sweat collection, a lack of standardization and risk of skin irritation and injury [3].

In this work, we aimed to prepare and evaluate the efficiency and the cutaneous tolerability of pilocarpine geldisc as an alternative to pilocarpine solution in QPIT.

2-Material & Methods

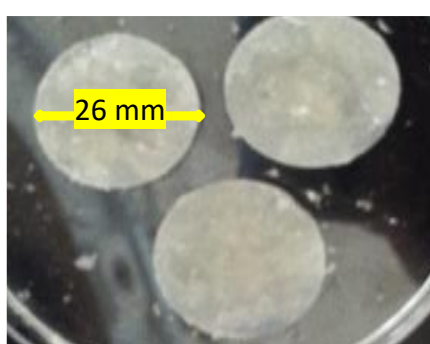
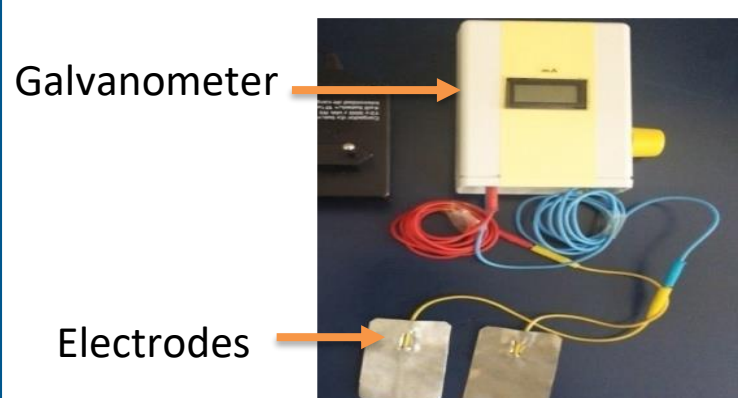


Figure 1: Iontophoretic apparatus ELION 255 Figure 2 : Pilogel 0.5% Disc

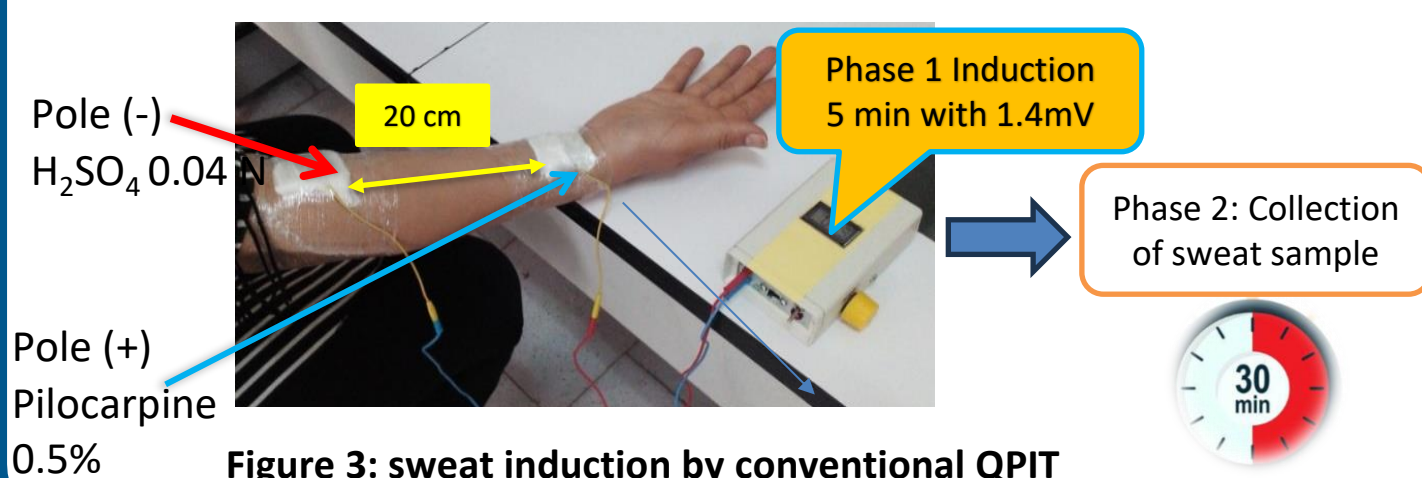


Figure 3: sweat induction by conventional QPIT

3-Results & Discussion



Figure 4 : Sweat weights after iontophoretic induction by pilogel discs and pilocarpine solution



Figure 5 : transitory skin irritation



Figure 6 : filter paper impregnated with sweat collected within 30 min

According to standards and guidelines for sweat test [1], results obtained with pilogel disc were favorable for QPIT

4-Conclusion

This preliminary assay demonstrated the effectiveness of pilogel disc 0.5% to induce an adequate sweat secretion with 1.5mV of electric current in QPIT; Yet, its tolerability needs to be evaluated in a larger population and under different operating conditions.

5-References

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