
Poster

[P27-8] P27-8: Assay and monitoring

Chair: Yoshihiko Hirotsu, Japan

Wed. Sep 27, 2017 12:30 PM - 1:30 PM Annex Hall (1F)

(Wed. Sep 27, 2017 12:30 PM - 1:30 PM Annex Hall)

[P27-8-8] The real time inhalation flow pattern monitoring system contributes to adequate inhalation patterns of soft mist inhaler co-prescribed with dry powder inhaler

Hiroyoshi Koide¹, Daiki Hira², Shigemi Nakamura³, Toyoko Okada⁴, Kazunori Ishizeki⁵, Tetsuya Minegaki⁶, Masayuki Tsujimoto⁷, Masafumi Yamaguchi⁸, Shin-Ya Morita⁹, Kohshi Nishiguchi¹⁰, Yasutaka Nakano¹¹, Tomohiro Terada¹² (1.Kyoto Pharmaceutical University, 2.Shiga University of Medical Science Hospital, 3.Hitachi Automotive Systems, Ltd, 4.Hitachi Automotive Systems, Ltd, 5.Hitachi Automotive Systems, Ltd, 6.Kyoto Pharmaceutical University, 7.Kyoto Pharmaceutical University, 8.Shiga University of Medical Science, 9.Shiga University of Medical Science Hospital, 10.Kyoto Pharmaceutical University, 11.Shiga University of Medical Science, 12.Shiga University of Medical Science Hospital)

Keywords: inhalation flow pattern monitoring system, inhalation instruction, dry powder inhaler, soft mist inhaler, chronic obstructive pulmonary disease

Background

The main clinical toxicity of inhalation therapy is the local adverse effects such as cough and hoarseness, and which can lead to withdrawal of inhalation therapy. For dry powder inhaler (DPI), high peak inhalation flow rate (PIFR) is required to disperse the micronized drug particle, but for soft mist inhaler (SMI), lower PIFR and long inhalation duration time (DT) are required to prevent the deposition to the oropharyngeal area and recover the long-lasting mist. These things suggest that adequate inhalation pattern may contribute to reduction of the local adverse effects as well as improvement of the clinical efficacy. In the present study, we developed orifice adaptors for the inhalation flow pattern monitoring system, which are suitable for various inhalers, and investigated the clinical application of the monitoring system.

Methods

We constructed orifice adaptors for the inhalation flow pattern monitoring system adjusted for various commercial inhalers, and examined the correlation between the inhalation resistance of orifice and inhalation device. To confirm the usefulness of the monitoring system, the patients co-prescribed DPI and SMI were monitored their inhalation flow patterns before and after inhalation instruction.

Results

The inhalation resistance of commercial inhalers are listed in following order; Twincaps[®] >Handihaler[®] >Swinghaler[®] = Clickhaler[®] >Twisthaler[®] >Turbuhaler[®] >Jenuair[®] >Diskus[®] = Ellipta[®] >Diskhaler[®] >Breezhaler[®] >Respimat[®] = pressurized metered dose inhaler (pMDI). The pressure drop via orifice was significantly correlated with that via the commercial inhaler (R²=0.985). All participants achieved the DPI criterion of PIFR, but 4 patients (6 clinical visits) of 10 could not achieve the essential criterion of DT (> 1.5 sec.) for SMI. A typical mistake of inhalation procedure was the rapid and short inhalation of SMI due to confusion with DPIs, and all participants significantly prolonged their DT after inhalation instruction by pharmacists (P<0.05).

Conclusions

We successfully constructed orifice adaptors for the real time inhalation flow pattern monitoring system, which can detect the patients with inadequate inhalation pattern (short DT) of SMI and confirm prolongation of their DT of SMI after inhalation instruction. The monitoring system would contribute to the adequate inhalation therapy.