Transient Decrease in Peak Expiratory Flow Rate During Immunoadsorbent Therapy

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Although the release of various chemical mediators has been well documented during immunoadsorbent therapy (IAT),¹ little is known about their clinical effects on bronchi. A peak flowmeter, a simple, inexpensive handheld device, has been used to measure the peak expiratory flow rate (PEFR),² a sensitive indicator for bronchospasms. We studied the possible effects of IAT on PEFR using measurements with this device in relation to peripheral leukocyte count.

Methods

We measured the PEFRs (n=7) of patients with autoimmune neurological diseases including Guillain-Barré syndrome, Fisher syndrome and myasthenia gravis using a peak flowmeter before and during IAT at 15, 30, 60 and 120 minutes (n=8). Leukocyte count (n=5) and arterial blood gas (n=4) were also obtained. IAT was conducted using the OP-05 and TR-350 of Asahi Medical Inc. Nafamostat mesilate was used as the anticoagulant. PEFRs were measured with a peak flowmeter (mini-Wright®), a simple handheld device, and the paired Student's t-test was used for statistical analysis.

Results

PEFRs showed a significant fall at 15 minutes (p=0.019) but returned to their initial levels by 120 minutes (around the end of IAT) (Fig.1). One patient with a history of asthma became symptomatic during IAT, but recovered without specific treatment (Fig.2). Leukocyte counts were lowered significantly at 15 (p=0.0062) and 30 minutes (p=0.015), and then increased to their initial levels or more at 120 minutes (Fig.3). The PaO₂ level showed a slight decrease (Fig.4) and PaCO₂ a slight increase (Fig.5), but neither change was statistically significant.

Conclusions

IAT seems to reduce the PEFR within 15 minutes of initiating the procedure, and may trigger an attack in patients with a history of asthma. PaO₂ and PaCO₂ levels might also be slightly altered during IAT. Coinciding with the timing of decreased peripheral leukocyte count, this transient decrease in PEFR might be attributed to the pulmonary sequestration of leukocytes locally inducing bronchospasms.
Fig. 1 Change in PEFR during IAT

Fig. 2 Individual change in PEFR during IAT

Fig. 3 Change in leukocyte count during IAT

Fig. 4 Change in PaO2 during IAT

Fig. 5 Change in PaCO2 during IAT

References
