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Title: Inhalation characteristics with Spiromax® (S) versus Turbuhaler® (T) dry powder inhalers (DPI) in healthy adults (HA) and in patients with asthma (A) or COPD

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Body: Objective: The ability of patients to achieve a satisfactory inhalation manoeuvre through a DPI is affected by age, training and severity of their asthma or COPD. We measured inhalation characteristics when patients and HA inhaled through placebo S and T. Methods: HA and patients with asthma (Child CA 6–11y, Adolescent AA 12–17y and adults >17y) or COPD were randomised in an open-label crossover design to S or T and received verbal training (using each patient information leaflet). An inhalation profile recorder was attached to each device to measure the inhalation manoeuvre. The profile with the highest peak inspiratory flow (PIF in L/min) was used for analysis. Results: Asthma patients had a mean FEV₁ %pred of 54–69% and COPD patients of 52%. Inhalation parameters: PIF, maximum pressure change (MPC in kPa), initial acceleration of flow (ACC in kPa/sec) and time to PIF (Tp in sec) are presented in Table 1.

Mean (SD) inhalation characteristics

	CA	AA	Adult asthma	COPD	HA
n	23	27	50	50	50
Spiromax					
PIF	67.9(16.9)	67.9(15.10)	74.4(18.1)	57.5(21.0)	85.0(13.6)
MPC	4.8(2.5)	4.7(2.2)	5.7(2.6)	3.7(2.7)	7.3(2.3)
ACC	12.9(11.2)	12.1(8.8)	15.6(15.7)	11.0(12.8)	15.9(13.5)
Tp	0.61(0.28)	0.75 (0.35)	0.94(0.66)	0.68(0.38)	1.02(0.54)
Turbuhaler					
PIF	57.3(13.8)	57.8(13.4)	65.4(17.5)	50.1(16.2)	78.0(11.8)

MPC	3.9(2.0)	3.9(1.8)	5.1(2.6)	3.1(2.0)	7.0(2.1)
ACC	11.3(8.5)	11.4(7.2)	13.0(12.1)	8.4(9.5)	12.8(9.6)
Tp	0.75(0.65)	0.74(0.46)	0.86(0.49)	0.97(0.87)	1.19(0.70)

Conclusions: Patients (regardless of age and baseline disease severity) achieved more favourable inhalation parameters to deaggregate the metered dose in a S than those through the T. Funding: TEVA Pharmaceuticals.