Abstract P85 Figure 1

Conclusions Early administration of antibiotics did not shorten disease course in our cohort but is correlated with prolonged inpatient stay and oxygen therapy. Furthermore, antibiotics prescribed at presentation in preschool children with wheeze do not reduce future episodes of wheeze requiring hospital admission.

REFERENCE

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P86

IN VITRO AND CLINICAL CHARACTERISATION OF THE ANTISTATIC VALVED HOLDING CHAMBER AEROCHAMBER PLUS® FLOW-VU® FOR ADMINISTRATING TIOTROPIUM RESPIMAT® IN 1–5-YEAR-OLD CHILDREN WITH PERSISTENT ASTHMATIC SYMPTOMS

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Introduction Characterisation of any inhalation product requires a comprehensive assessment including *in vitro*, pharmacokinetic (PK), and clinical Results We assessed tiotropium Respimat® administered with the AeroChamber Plus® Flow-Vu® antistatic valved holding chamber (test VHC) using *in vitro*, PK and clinical data in 1–5 year-olds with persistent asthmatic symptoms.

Methods We evaluated tiotropium delivered into a cascade impactor under fixed paediatric flow rates with and without holding times in the test VHC. Tidal breathing simulations and an anatomically correct ADAM-III Child Model were

employed to assess the tiotropium mass likely to reach the lungs of preschool children when Respimat® was administered with the test VHC. Clinical characterisation was based on a 12 week, randomised trial of once-daily tiotropium Respimat® or placebo as add-on to background therapy in 1–5 year-olds with persistent asthmatic symptoms (NCT01634113). PK data on systemic exposure to tiotropium Respimat® administered with test VHC in preschool children were compared with pooled data from older patients with symptomatic persistent asthma not using VHCs (NCT01383499/NCT01122680/NCT01233284/NCT01152450/NCT01696071/NCT00772538/NCT00776984/NCT01172808/NCT01172821).

Results *In vitro* emitted mass decreased with lower flow conditions, indicating age-dependent dose reduction. In terms of dose per kg/body weight, delivered dosing at flow rates corresponding to preschool children was comparable to that at flow rates corresponding to older children (Table). Transmission and holding properties of tiotropium Respimat® administered by test VHC were fully sufficient for aerosol delivery of patients. Standardised tidal inhalation resulted in emitted mass from the test VHC of approximately one-third of labelled dose, independent of coordination and face mask use, indicating predictable tiotropium administration by Respimat® when used with test VHC. ADAM-III model data correlated well with standardised tidal breathing Results in terms of total mass delivered and mass delivered to filter (available to lungs). In separate clinical trials, tiotropium exposure in 1–5 year-old patients using the test VHC, adjusted by height or body surface, was comparable with that observed in older patients not using VHCs, with no overexposure. Safety of tiotropium Respimat® in 1–5 year-olds was comparable to placebo.

Conclusion This study supports administration of tiotropium Respimat® with the AeroChamber Plus® Flow-Vu® VHC in 1–5 year-old children with persistent asthmatic symptoms.

Abstract P86 Table 1 *In vitro* medication delivery through the test VHC with small/medium face masks at different flow rates and holding times

Flow rate and corresponding age	Mask	Holding time, s	Mean medication delivery through test VHC, µg/dose	Body weight 50th percentile, kg	Medication delivered per dose, ng/kg*
4.9 L/min (6–12 months)	Small	0	0.85 (±0.04)	7.5–9.9	86–113
		2	0.86 (±0.14)		87–115
		5	0.55 (±0.16)		56–73
		10	0.62 (±0.02)		63–83
8.0 L/min (2–5 years)	Medium	0	0.74 (±0.05)	12.3–18.0	41–60
		2	0.93 (±0.05)		52–76
		5	0.72 (±0.07)		40–59
		10	0.57 (±0.05)		32–46
12.0 L/min (>5 years)	Medium	0	1.16 (±0.07)	18.0	64
		2	0.96 (±0)		53
		5	0.78 (±0.18)		43
		10	0.61 (±0.02)		34

Data corresponding to age group 13–23 months are not available.

* Inhalation of 2.5 µg tiotropium Respimat (as two actuations) in a 70 kg adult without use of the test VHC and face mask delivers approximately 2.5 µg or 36 ng/kg.

P87 BENCHMARKING OF PAEDIATRIC DIFFICULT ASTHMA PHYSIOTHERAPY SERVICES

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Introduction Children with difficult asthma (DA) comprise 2%–5% of all children with asthma but use 50% of national asthma health care provisions, they have high levels of morbidity and poor quality of life. Guidelines recommend children with DA should be assessed by a specialist multidisciplinary team, including physiotherapy, to confirm an asthma diagnosis, exclude alternative causes of persistent symptoms, manage co-

morbidities, confirm adherence and ensure treatment is appropriate. Physiotherapy may involve breathing pattern retraining, airway clearance, exercise, symptom differentiation, relaxation techniques, self-management and overcoming barriers to adherence. Currently there are no validated condition specific screening tools, outcome measures, methods of assessment or standardised treatments for breathing pattern disorders in children. Physiotherapy intervention improves asthma symptom scores, quality of life¹ and A and E attendances and hospital admissions.² We aimed to investigate physiotherapy services and treatments currently being offered at paediatric centres nationally and whether the current guideline recommendations were being met.

Method Physiotherapists from twenty-two UK hospitals were invited to complete a questionnaire about service size and provision, referral systems, screening tools, assessment and outcome methods and treatments offered.

Results 18/22 centres responded. Sixteen (89%) did not have funded DA physiotherapy, twelve (66%) had no dedicated DA physiotherapy time. Seventeen (94%) relied on referrals from DA consultants and nurses, rather than physiotherapists having the opportunity to routinely assess DA patients. There was no consensus about paediatric screening tools, assessment protocols or outcome measures (figure 1). There was marked variation in what was offered ranging from only performing airway clearance reviews to a full breathing pattern assessment, cough management, sleep, continence, exercise prescription, musculo-skeletal treatment, relaxation/anxiety management, sinus management and advice and education.

Conclusion Paediatric physiotherapy services for DA are largely *ad hoc* and reactive. Despite guideline recommendations, physiotherapy for paediatric DA is currently an unmet clinical need with no agreed diagnostic or management algorithms. There is a clear need to better define the role of physiotherapy in DA.

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Abstract P87 Figure 1 Outcome measures used by physiotherapists across the UK.