Guideline topic: Pharmacological management of asthma
Evidence table 4.2: Ipratopium bromide

Author	Year	Study type	Quality rating	Population	Outomes measured	Effect size	Confidence intervals / p values	Comments
Adults								
Bariffi[1]	1986	Randomised, comparing duovent (fenoterol plus ipratropium) vs placebo	+	20 asthmatics with asthma and 20% reversibility.	FEV1	At 30 min, increase of 26.2%	P< 0.01	Not addressing issue of ipratropium alone
Elwood and Abboud[2]	1982	Double-blind randomised, cross over except for 6th visit, comparing fenoterol, ipratropium and combination.	+	10 patients with chonic asthma (21-61yrs); 58% pred FEV1; > 20% increase in FEV1 with bagonist; patients on b-agonists, theophylline and BDP	1. FEV1, FVC, FEFV (AUC over 6 hrs)	Imratropium caused 20.1 +-6.6% increase in FEV1 AUC 100 ug Fen plus IPRA 40 ug was similar to 200 ug FENO	P< 0.05	Small study, main interest was effect of combination therapy. Comparison to fenoterol, not a b-agonist used frequently in UK.
Higgins[3]	1991	Crossover study	++	9 patients with asthma	FEV1 and sGaw	Salbutamol (5,100, 750		Date not applicable

		examining cumulative doses of salbutamol or ipra in double blind, randomised protocol		and 10 with chronic bronchitis		and 1000 ug) and ipratropium (similar doses) caused similar max increase in FEV1 (0.58 and 0.59L) in both groups.		
Hockley[4]	1985	IPRA (80, 200, 400 ug) in 9 asthmatics D-blind, randomised, placebo controlled	++	9 asthmatics	FEV1	Max increase in FEV1 was 25% after 80 ug, and 30% fro the two higher doses. Duration was longer for 400ug dose). Max effect by 100 min.		Small numbers. More effect at higher doses.
Hunt[5]	1983	Doses of IPRA of 40, 80, 160 ug on FEV1 in 13 asthmatics, 15 bronchitis	+		FEV1 (peak change)	Changes were 0.51, 0.64, 0.55L for the doses, change sign sustained for 3,6 and 8 hours at the increasing doses.		Study shows the prolonged bronchodilator response with higher doses, although all doses cased similar max response. Small number of patients.
Kreisman[6]	1984	Ipra (40 ug) or theophytlline or both	+	12 asthmatics	FEV1	By 30 min increase in FEV 1 z/fer IPRA was 11.7%	P< 0.05	Small study showing bronchodilator effect, potentiated by theophylline
Burki[7]	1997	Randomised double blind, placebo	+	19 patients aged 15-52 years	1)FEV_1 at 15 min, 30 min, 1	Each regimen resulted in a significant	P<0.05	The optimum dose of theoph. was established

		controlled crossover		(mean 27.7) FEV1 29 – 67 (mean 53.8) % pred. 15 % reversibility to B2-agonists No oral steroids Compared single doses of oral theoph. and inhaled iprat., alone or in combination	hr, 2 hr….up to 6 hours for each regimen) Side effects, BP, pulse, ECG	increase in FEV_1 The combined regimen resulted in significantly greater effect FEV_1=3.0 L (iprat.+ theoph.) vs 2.5 L (iprat.) vs 2.6L (theoph.) at 3 hrs post drug No significant side effects reported for any treatment.	P<0.05	at screening day 3, to achieve theoph. concentrations 10-20 µg/ml when 10/32 patients screened were excluded. There were 4 dosage regimes Regimen A- theoph. + inhaled placebo Regimen B- oral placebo + inh iprat. Regimen C- theoph. + inhaled iprat. Regimen D- oral and inhaled placebo Note- theophylline short-acting tablets were used
Ruffin[8]	1982	D-bvlind, placebo controlled, single dose of IPRA (60 ug), or feneterol (200 ug) or various combinations of each	++	18 asthmatics (20% increase in Fev 1 with salb)	FEV1			DATA not applicable

Sahlstrom[9]	1986	Fenoterol, IPRA (40 ug) and combination compared in d-blind placebo controlled and cross over.	++	24 adult asthmatics	SGAW FEV1	0.53 L increase after IPRA after 2 hrs	P< 0.001	Small numbers. Comparative study with combination.

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4. Hockley B, Johnson NM. A comparison of three high doses of ipratropium bromide in chronic asthma. Br J Dis Chest 1985;79(4):379-84.
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9. Sahlstrom K, Alanko K, Harkonen R. Treatment of asthma bronchiale with a combination of ipratropium bromide and fenoterol. Respiration 1986;50(Suppl 2):302-9.