COMPARISON IN RATES OF BREAKTHROUGH TREATMENTS DURING A CONVERSION FROM RACEMIC ALBUTEROL TO LEVALBUTEROL

Robert S Pikarsky, BSRT, Russell A. Acevedo, MD, FAARC, FCCP, Tracey Farrell, RRT, Renee Bear, RRT and Wendy Fascia, RRT. Respiratory Care, November 2003, Volume 48, Number 11, Page 1080.

Purpose: In order to meet our adult patient care demands, Crouse Hospital approved an automatic conversion from Racemic Albuterol to Levalbuterol. This study compares the breakthrough rates of Racemic Albuterol and Levalbuterol, with and without Ipratropium. Different dosing schedules for Levalbuterol were evaluated.

Methods: Racemic Albuterol (Alb) 2.5 mg Q4h was converted to either Levalbuterol (Lev) 0.63 mg Q6h or Levalbuterol 0.63 mg Q8h. Patients dosed Q8h who required more frequent aerosol administration received Levalbuterol 0.63 mg Q6h (cardiac patients) or Levalbuterol 1.25 mg Q8h (all others). If ordered, Ipratropium (Ipra) 0.5 mg was administered at the same frequency as the Levalbuterol. A majority of aerosol therapy was provided with the use of the AeroEclipse Breath Actuated Nebulizer (BAN). All aerosol treatments, including breakthrough treatments, delivered between June 1, 2002 and September 30, 2002 were recorded.

Results: Tx/Pt/day represents the number of treatments delivered per patient per day. Rate/100 Pt/days = (Breakthrough) / (Total Tx / Tx/Pt/day) x 100. Rate/100 Pt/days corrects for the differences in daily administration frequency, and may better reflect the daily impact of the breakthrough rate. The breakthrough rate of the combined Albuterol group was significantly greater than all Levalbuterol groups (25.8 vs. 18.43, 25.8 vs. 18.43, 25.8 vs. 5.96 p<.001)*. The breakthrough rate with Albuterol was significantly reduced with the addition of Ipratropium (40.76 vs. 13.35 p<.001)**. The 1.25 mg dose of Levalbuterol outperformed both 0.63 mg dosage groups (3.78 vs. 13.48 p<.02, 3.78 vs. 21.36 p<.001) ***. Ipratropium did not significantly change the breakthrough rate when added to Levalbuterol groups.

Medication	Total Tx	Breakthrough	Rate/1000	Tx/Pt/day	Rate/100 Pt/day	
Alb Q4h	898	61	67.93	6	40.76**	25.80*
Alb/Ipra Q4h	1079	24	22.24	6	13.35**	
Lev 0.63mg Q6h	2047	69	33.71	4	13.48***	18.43*
Lev 0.63 mg/Ipra Q6h	2728	151	55.35	4	22.14	
Lev 0.63mg Q8h	660	47	71.21	3	21.36***	18.43*
Lev 0.63 mg/Ipra Q8h	707	37	52.33	3	15.70	
Lev 1.25mg Q8h	238	3	12.61	3	3.78***	5.96*
Lev 1.25mg/Ipra Q8h	215	6	27.91	3	8.37	

Conclusion: The conversion from Racemic Albuterol to Levalbuterol allowed for a decreased frequency of daily medication administrations and a significant decrease in breakthrough requirements. Levalbuterol at the 1.25 mg dose performed better than the 0.63 dose for Q8h administration. Ipratropium showed a significant benefit in breakthrough reduction for the Racemic Albuterol group.

Clinical Implications: The efficiencies gained by decreasing the daily frequency of aerosol administration can have a significant impact on resource utilization. The conversion to Levalbuterol allows for decreased respiratory therapy time or the re-allocating of workforce needs while maintaining, or improving, quality of aerosol administration, as evidenced by the decrease in breakthrough requirements.