CLINICAL EVALUATION OF BREATH ACTUATED SMALL VOLUME NEBULIZER (BAN-SVN)

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Background: In prior *in-vitro* studies using laser diffractometry, the aerosol produced by a novel breath-actuated nebulizer (BAN), the ***AeroEclipse***™ BAN (Monaghan Medical Corp. Plattsburgh, N.Y.) has been shown to contain a high proportion of droplets < 4.8µm diameter (80.9% ± 2.4%). Such droplets are more likely to penetrate beyond the oropharyngeal region where bronchodilation is achieved. These *in-vitro* results should therefore be predictive of improved *in-vivo* delivery of nebulized medications to the respiratory tract. This study explored the clinical performance of the ***AeroEclipse***™ BAN in the delivery of a beta2-agonist (albuterol 2.5 mg/ml) accompanied by anticholeninergic (ipratroprium bromide 250µg/ml) bronchodilator in some cases.

Methods: Patients (n=48) with a previous diagnosis for asthma presenting to the Emergency Department for acute exacerbation of asthma were included in this study. Upon presentation, an asthma care path, an assessment driven, algorithm-based tool was used to place patients in one of three stages of severity as recommended by the NIHNAEPP Guidelines for the Diagnosis of Asthma. Each patient was assigned to receive inhaled aerosol treatment using the ***AeroEclipse***™ BAN. Stage 1 asthmatics were given 0.5-ml of albuterol with 0.5-ml normal saline delivered until sputter. Patients categorized in stage two and three were given 0.5-ml albuterol, with the addition of 1.5-ml ipratroprium bromide unit dose. Treatments repeated every 20 minutes times three if necessary by protocol.

Results:	Stage 1	Stage 2	Stage 3
Asthma Severity	10	30	8
Number	2.4	2.03	2.25
Treatments given	3.7	3.78	5
Treatments Duration (min)	44(0-120)	67.7(-2.7-580)	120.7(28-420)
Increase in PEF (%, range %)			

Four patients had greater than 20% increase in heart rate, three patients noted tremor following treatment. Twenty-four patients had positive comments about the device focused on shorter treatment time and improved relief from dyspnea. Two imminent intubations were avoided with the use of the BA-SVN.

Conclusions: Use of the ***AeroEclipse***™ BAN appears to result in good clinical outcomes. Minimum number of treatments, shorter treatment duration and minimal side effects were noticed with this device. Further outcome studies are needed to assess this impact on other groups of patients.

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