RJNMSR
Review Journal of Neurological & Medical Sciences Review

Volume 3, Issue 3, 2025

EFFICACY OF NEBULIZED MAGNESIUM SULPHATE IN ACUTE BRONCHIOLITIS IN PATIENT ADMITTED TO PEDIATRIC WARD OF BACHA KHAN MEDICAL COMPLEX/ GAJJU KHAN MEDICAL COLLEGE SWABI

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DOI: https://doi.org/10.5281/zenodo.16350720

Received	Accepted	Published
22 April, 2025	26 June, 2025	23 July, 2025

ABSTRACT

Bronchiolitis, a common respiratory illness in pediatric patients, often caused by viruses like respiratory syncytial virus (RSV) leads to airway inflammation and symptoms such as coughing and difficulty breathing, often requiring hospitalization. Nebulized magnesium sulfate has garnered attention for its potential to alleviate symptoms due to its bronchodilator and anti-inflammatory effects. The study aimed to evaluate the efficacy of Nebulized Magnesium Sulphate therapy compared to standard treatment in managing acute bronchiolitis. In this prospective, randomized controlled trial conducted at Bacha Khan Medical Complex/Gajju Khan Medical College's pediatric ward in Swabi, 148 pediatric patients aged 1 month to 2 years diagnosed with acute bronchiolitis were enrolled. The standard treatment group comprised 76 patients, receiving bronchodilator therapy alone, while the nebulized magnesium sulfate treatment group included 69 patients, receiving nebulized magnesium sulfate in addition to standard therapy. Relevant patient information, including age, sex, socioeconomic status, hospital stay duration, comorbid conditions, and outcomes measured by validated scoring systems such as the Respiratory Distress Assessment Instrument, were recorded. Data were analyzed using SPSS, and a t-test, chi-square correlation and paired tests were conducted for comparison. Despite variations in group sizes due to incomplete records, rigorous methodological protocols were maintained for unbiased randomization and meaningful analysis of outcomes. The analysis revealed similar frequencies of comorbid conditions and complications between the two treatment groups. However, Nebulized Magnesium Sulphate therapy showed a significantly lower mortality rate compared to standard treatment. Additionally, participants in the Nebulized Magnesium Sulphate group had a longer hospital stay duration. Nebulized Magnesium Sulphate therapy demonstrated promising outcomes in reducing mortality rates compared to standard treatment for acute bronchiolitis. However, further research is needed to optimize treatment protocols and improve overall efficacy.

Keywords: *acute bronchiolitis, pediatric patients, Nebulized Magnesium Sulphate therapy, standard treatment, outcomes.*

INTRODUCTION

Bronchiolitis is a common respiratory illness affecting infants and young children, often caused by viral infections, particularly respiratory syncytial virus RSV. It is characterized by inflammation and

obstruction of the small airways (bronchioles), leading to symptoms such as cough, wheezing, difficulty breathing, and respiratory distress. While supportive care remains the mainstay of treatment for bronchiolitis, there is ongoing exploration into adjunctive therapies to alleviate symptoms and improve outcomes (1). Among these adjunctive therapies, nebulized magnesium sulfate (MgSO4) has gained attention due to its potential bronchodilatory and anti-inflammatory effects. Magnesium is known to modulate smooth muscle tone, inhibit acetylcholine release, and possess anti-inflammatory properties, making it a promising candidate for the management of acute bronchiolitis. However, the efficacy of nebulized magnesium sulfate in this context remains a subject of debate and requires further investigation. Several studies have explored the efficacy of nebulized magnesium sulfate in acute bronchiolitis, albeit with varying results (2).

A randomized controlled trial demonstrated that nebulized magnesium sulfate significantly improved clinical scores and reduced hospitalization rates in infants with moderate to severe bronchiolitis compared to placebo (3). These findings were supported by a meta-analysis conducted which concluded that nebulized magnesium sulfate could lead to improvements in clinical scores and respiratory parameters in children with bronchiolitis(4). Conversely, other studies have reported conflicting results regarding the efficacy of nebulized magnesium sulfate in bronchiolitis. For instance, a randomized controlled trial found no significant difference in clinical outcomes between infants treated with nebulized magnesium sulfate and those receiving placebo (5). Similarly, a Cochrane review concluded that there was insufficient evidence to support the routine use of nebulized magnesium sulfate in bronchiolitis due to conflicting results and methodological limitations of existing studies (6). The primary objective of this study is to evaluate the efficacy of nebulized magnesium sulfate in the management of acute bronchiolitis in pediatric patients admitted to the pediatric ward of Bacha Khan Medical Complex/Gajju Khan Medical College, Swabi. Specifically, this study aims to assess the impact of nebulized magnesium sulfate on clinical outcomes such as respiratory distress scores, oxygen saturation levels, length of hospital stay, and the need for additional interventions (e.g., supplemental oxygen, mechanical ventilation). Additionally, adverse effects associated with nebulized magnesium sulfate were monitored to ensure patient safety and tolerability of the intervention.

Methodology

This prospective, randomized controlled trial was conducted in the pediatric ward of Bacha Khan Medical Complex/Gajju Khan Medical College, Swabi, involving 148 pediatric patients aged 1 month to 2 years diagnosed with acute bronchiolitis confirmed by clinical symptoms and chest X-ray. Participants were randomized using a computer-generated sequence into two groups: 79 received standard bronchodilator therapy, and 69 received inhaled magnesium sulfate (weight-based) in addition to standard therapy. Patients with magnesium sulfate allergy, renal impairment, or significant comorbidities were excluded. Data collected included demographics, socioeconomic status, hospital stay duration, comorbid conditions, and outcome measures. The primary outcome was symptom improvement assessed by validated scoring systems, while secondary outcomes included hospital stay length, oxygen need, and adverse effects. Descriptive statistics (means, SDs, percentages) and inferential analyses (t-test, chi-square, paired tests) were performed using SPSS version 23, with $p<0.05$ considered significant. Ethical approval was obtained, and informed consent was secured from participants or guardians in accordance with the Helsinki Declaration.

Result

The table 1 provides data on 79 patients from group with standard treatment, detailing their serial number, age in months, weight in kilograms, gender, Z-score indicating deviation from the mean, security level, duration of hospital stay in days, any comorbid conditions, complications during their stay, and final outcome. For instance, the first entry depicts a female patient aged 1 month with a weight of 4.5 kilograms, exhibiting a Z-score of 0. Security level was marked as "+", and the patient had a hospital stay of 4 days with no comorbid conditions or complications, ultimately resulting in discharge. Similarly, the subsequent entries offer similar comprehensive information about each patient's medical profile, treatment, and outcome, including cases of complications and non-standard outcomes such as discharge against medical advice or expiration.

Table 1: Standard treatment

S.No.	Age	Wt	Gender	Z-score	Security	Hospital stay	Comorbid	Complication	Outcome
1	1	4.5	F	0	+	4	Nil	Nil	Discharge
2	2	6	F	0	++	3	Nil	Nil	Discharge
3	8	4.5	M	-3	++	3	CHD(ASD2)	Nil	Discharge
4	3m	5.5	M	0	++	3	Nil	Nil	Discharge
5	2m	6	F	0	+	2	Nil	Nil	Discharge
6	2m	4.5	M	-2	++	4	Nil	Nil	Discharge
7	8m	7	M	-2	++	4	Nil	Nil	Discharge
8	8	8	M	0	++	2	Nil	Nil	Discharge
9	1.5	4.2	F	0	++	2	Nil	Nil	Discharge
10	4	6	M	0	++	0	Complexcsd	Nil	Discharge
11	3	7	M	0	++	6	Nil	Nil	Discharge
12	1.5	4.7	F	0	++	4	Nil	Nil	Discharge
13	2	6	M	0	++	3	Nil	Nil	Discharge
14	3	5.5	M	0	+	3	Nil	Nil	Discharge
15	3	6	F	0	++	2	Nil	Nil	Discharge
16	5	4.3	F	-3	++	5	Nil	Nil	Discharge
17	5	6.8	M	0	++	3	Nil	Nil	Discharge
18	2	4	F	-2	++	3	Nil	Nil	Discharge
19	4	7.5	F	0	++	2	Nil	Nil	Dow
20	3	6	M	0	++	3	Nil	Nil	Discharge
21	7	8	M	0	++	3	Nil	Nil	Discharge
22	1.5	4	F	0	++	3	Nil	Nil	Discharge
23	11	4.7	M	-3	++	5	PCM	Nil	Discharge
24	2	4	M	-2	++	7	Nil	Nil	Discharge
25	1.5	6.7	F	0	++	3	Nil	Nil	Discharge
26	2	6	M	0	++	3	Nil	Nil	Discharge
27	3	5,5	M	0	+	3	Nil	Nil	Discharge
28	3	6	F	0	++	2	Nil	Nil	Discharge
29	5	4.3	F	-3	++	5	Nil	Nil	Discharge
30	5	6.8	M	0	++	3	Nil	Nil	Discharge
31	2	4	F	-2	++	3	Nil	Nil	Dow
32	4	7.5	F	0	++	3	Nil	Nil	Discharge
33	3	6	F	0	++	3	Nil	Nil	Discharge
34	7	5.2	M	-3	++	3	Nil	Nil	Discharge
35	3	5.8	M	0	++	4	Nil	Nil	Discharge
36	2	4.5	M	0	++	6	Nil	Nil	Discharge
37	11	6.2	M	-2	++	8	Down'S CHD	Nil	Discharge
38	11	10.5	M	0	++	4	Nil	Nil	Discharge
39	7	8.2	F	0	++	3	Nil	Nil	Discharge
40	4	5.2	M	-2	++	3	Nil	Nil	Discharge
41	2	3	M	-3	++	3	Nil	Nil	Discharge
42	9	7	M	-2	++	5	Nil	Nil	Discharge
43	6	7	F	0	++	3	Nil	Nil	Discharge
44	2.5	4.5	M	-2	+	3	Nil	Nil	Discharge
45	4	5	M	-3	++	3	Nil	Nil	Discharge
46	6	7	F	-2	+	11	Nil	Nil	Discharge
47	12	2.5	M	-3	+	2	Nil	Nil	Discharge
48	1.5	4	F	-3	++	2	Nil	Nil	Discharge

49	3	4.8	F	-2	+	5	Nil	Nil	Discharge
50	1.5	4.5	M	0	++	2	Nil	Nil	Discharge
51	1.5	5	M	0	++	3	Nil	Nil	Discharge
52	5	6	F	-2	++	4	Nil	Nil	Discharge
53	5	3.6	F	0	++	7	Nil	Nil	Discharge
54	1.5	9	F	-2	++	5	Nil	Nil	Discharge
55	9	10	F	0	++	3	Nil	Nil	Discharge
56	20	3	M	0	+	4	Nil	Nil	Discharge
57	2	7	F	-3	+	2	Nil	Nil	Discharge
58	4	4	F	0	++	2	Nil	Nil	Discharge
59	2	4.8	M	-2	+	2	Nil	Nil	Lama
60	4	4.5	F	-2	+	2	Nil	Nil	Discharge
61	1.5	2.5	F	-3	++	2	Nil	Nil	Discharge
62	3	5	M	-2	++	6	CHD(VSD)	Nil	Discharge
63	11	8	M	0	++	11	Nil	Nil	Discharge
64	11	6.4	M	-3	+	2	Nil	Nil	Lama
65	3	5	M	-2	++	6	Nil	Nil	Discharge
66	11	8.7	F	0	+	2	Nil	Nil	Discharge
67	10	8	F	0	+	3	Nil	Nil	Discharge
68	3	5.5	M	0	++	4	Nil	Nil	Discharge
69	1.0	2	M	-3	++	4	Nil	Nil	Discharge
70	7	10	M	0	++	2	Nil	Nil	Discharge
71	8	8	M	0	+	2	Nil	Nil	Discharge
72	6	7	M	0	+	5	Nil	Nil	Discharge
73	2	4	F	-2	++	2	Nil	Nil	Discharge
74	9	7	M	-2	+	3	Nil	Nil	Discharge
75	4	6.3	M	0	++	0	Nil	Nil	Discharge
76	2	4	F	-2	++	2	Nil	Nil	Expired
77	4	4.4	M	-3	++	5	Nil	Nil	Discharge
78	2	4.2	M	-2	++	5	CHD	Nil	Discharge
79	3	4	F	-3	++	2	Nil	Nil	Discharge

"Serial no" represents the serial number of the entry.
"Age (Month)" represents the age in months.
"Wt (Kg)" represents the weight in kilograms.
"Gender" represents the gender of the individual (M for Male, F for Female).
"Z-score" is a statistical measure indicating the deviation from the mean in terms of standard deviations.
"Security" indicates the security level.
"Hospital stay (Day)" represents the duration of hospital stay in days.
"Comorbid Condition" specifies any pre-existing medical condition.
"Complication" describes any complications during the stay.
"Outcome" indicates the final outcome (Discharge, Dow (Discharge against medical advice), Lama (Left against medical advice), Expired).

The table 2 presents data on Nebulized Magnesium Sulphate treatment for 69 patients, including their serial number, age in months, weight in kilograms, gender, Z-score indicating deviation from the mean, security level, duration of hospital stay in days, presence of comorbid conditions, any complications during treatment, and the ultimate outcome. For instance, the first entry denotes a 2.5-month-old female weighing 5 kilograms, with a Z-score of 0, marked as "++" for security, stayed in the hospital for 3 days with no comorbid conditions or complications, leading to discharge. Each subsequent entry follows a similar pattern, providing a comprehensive overview of the treatment outcomes for patients undergoing nebulized magnesium sulphate therapy.

Table 2: Nebulized Magnesium Sulphate

S. No.	Age	Wt	Sex	Z-score	Security	Hospital stay	Comorbid	Complication	Outcome
1	2.5	5	F	0	++	3	Nil	Nil	Discharge
2	12	6.5	M	-3	++	5	Nil	Nil	Discharge
3	2.5	4.6	F	-2	++	6	Nil	Nil	Discharge
4	3	5	F	0	++	3	Nil	Nil	Discharge
5	5	5	M	-3	++	3	Nil	Nil	Discharge
6	2	3.5	F	-2	++	10	Nil	Nil	Discharge
7	2.5	5.4	M	0	++	4	Nil	Nil	Discharge
8	4	7.3	M	0	++	7	Nil	Nil	Discharge
9	4	4	M	-3	++	5	Nil	Nil	Discharge
10	5	5	F	-2	++	2	Nil	Nil	Discharge
11	5	7	F	0	++	4	Nil	Nil	Discharge
12	2	5	M	0	++	7	Nil	Nil	Discharge
13	1.	4	M	-2	++	3	Nil	Nil	Discharge
14	1	5.5	M	0	++	4	Nil	Nil	Discharge
15	3	5.5	F	0	+	2	Nil	Nil	Discharge
16	18	9	F	-2	++	4	Nil	Nil	Discharge
17	1.5	5	F	0	++	3	Nil	Nil	Discharge
18	1.5	5	M	0	++	4	Nil	Nil	Discharge
19	1	3.3	M	-2	++	4	Nil	Nil	Discharge
20	1.5	4	M	-2	++	2	Nil	Nil	Discharge
21	2	4	M	-2	++	11	Nil	Nil	Discharge
22	4	5.8	M	0	++	6	Nil	Nil	Discharge
23	3	5	F	-2	++	3	Nil	Nil	Discharge
24	7	6.2	F	-2	++	4	Nil	Nil	Discharge
25	11	7.5	M	-2	++	6	Nil	Nil	Discharge
26	2	3.2	M	-3	++	6	Nil	Nil	Discharge
27	15	8	M	-2	+	2	Nil	Nil	Discharge
28	4	5.8	F	0	+	2	Nil	Nil	Discharge
29	2.5	3.5	F	-3	++	9	Nil	Nil	Discharge
30	2	6	M	0	++	4	Nil	Nil	Discharge
31	17	9	M	0	+	1	Nil	Nil	Discharge
32	5	6	F	0	++	5	Nil	Nil	Discharge
33	2	5	M	0	++	5	Nil	Nil	Discharge
34	5	5.4	M	-3	++	6	Nil	Nil	Discharge
35	2	5.5	F	0	++	3	Nil	Nil	Discharge
36	2	5	M	0	++	5	Nil	Nil	Discharge
37	4	7.3	F	0	++	5	Nil	Nil	Discharge
38	4	5.5	F	-2	++	4	Nil	Nil	Discharge
39	3	7	F	0	++	2	Nil	Nil	Discharge
40	3	4.4	M	-3	++	8	Nil	Nil	Discharge
41	2	5	F	0	++	6	Nil	Nil	Discharge
42	2.5	4	M	-2	++	4	Nil	Nil	Discharge
43	4	5	M	-3	++	3	Nil	Nil	Discharge
44	4	6.5	F	0	++	3	Nil	Nil	Discharge
45	4	5	M	-3	++	6	Nil	Nil	Discharge
46	2	4.8	F	0	++	6	Nil	Nil	Discharge
47	3	6.5	M	0	++	6	Nil	Nil	Discharge
48	8	7	M	-2	++	5	Nil	Nil	Discharge

49	10	7	M	-2	++	6	Nil	Nil	Discharge
50	2	6	M	0	++	5	Nil	Nil	Discharge
51	3	5	M	-2	++	6	Nil	Nil	Discharge
52	3.5	5	M	-2	++	2	Nil	Nil	Discharge
53	1	3.5	M	0	++	3	Nil	Nil	Discharge
54	5	6.8	M	0	++	3	Nil	Nil	Discharge
55	1.5	3.5	F	-2	++	2	Nil	Nil	Discharge
56	7	7.3	M	0	++	3	Nil	Nil	Discharge
57	5	6	M	-2	++	3	Nil	Nil	Discharge
58	2	5	F	0	++	4	Nil	Nil	Discharge
59	7	7	M	0	++	3	Nil	Nil	Discharge
60	8	7.5	F	0	+	1	Nil	Nil	Discharge
61	18	10	M	0	+	2	Nil	Nil	Discharge
62	1	5	M	0	++	3	Nil	Nil	Discharge
63	3	3.5	M	-3	++	8	Nil	Nil	Discharge
64	2	4	F	-2	++	6	Nil	Nil	Discharge
65	3	5.5	F	0	++	6	Nil	Nil	Discharge
66	1	3	F	-2	++	9	Nil	Nil	Discharge
67	20	11	M	0	++	3	Nil	Nil	Discharge
68	1.5	3.5	M	0	++	3	Nil	Nil	Discharge
69	5	7.5	M	0	+	2	Nil	Nil	Discharge

"Serial no" represents the serial number of the entry.
"Age (Month)" represents the age in months.
"Wt (Kg)" represents the weight in kilograms.
"Gender" represents the gender of the individual (M for Male, F for Female).
"Z-score" is a statistical measure indicating the deviation from the mean in terms of standard deviations.
"Security" indicates the security level.
"Hospital stay (Day)" represents the duration of hospital stay in days.
"Comorbid Condition" specifies any pre-existing medical condition.
"Complication" describes any complications during the stay.
"Outcome" indicates the final outcome (Discharge, Dow (Discharge against medical advice), Lama (Left against medical advice), Expired).

The figure 1a shows the composition of participants within the standard treatment group based on gender. Among the total of 79 participants, 34 were male, accounting for approximately 43% of the group, while 45 were female, comprising roughly 57% of the participants. This distribution indicates a higher representation of females compared to males within the standard treatment cohort. The figure 1b illustrates the distribution of participants based on gender in the Nebulized Magnesium Sulphate treatment group. Out of a total of 69 participants, 42 were male, constituting approximately 60.87% of the sample, while 27 were female, representing about 39.13% of the participants. This data highlights a higher representation of males compared to females in the treatment group.

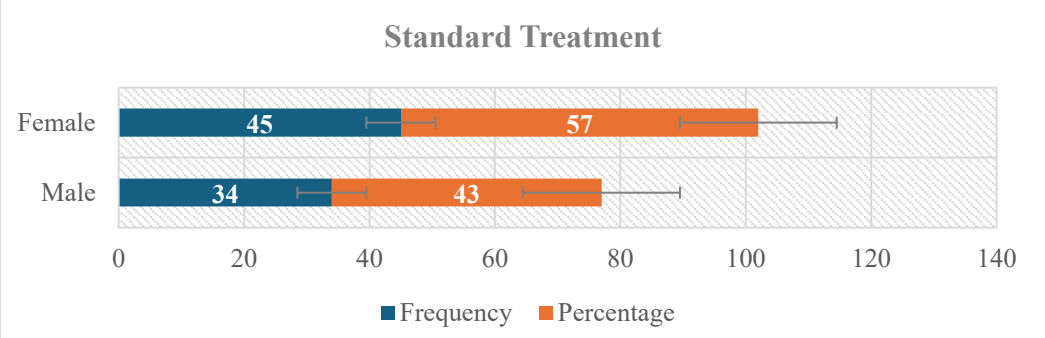

Figure 1a: Gender-based participants distribution in Standard Treatment

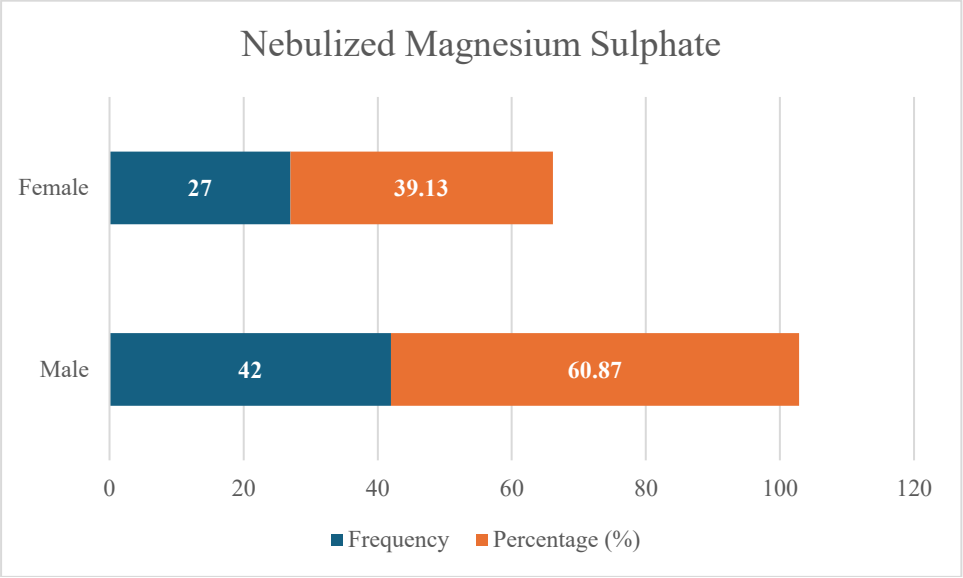

Figure 1a: Gender-based participants distribution in Nebulized Magnesium Sulphate Treatment

The comparison in table 3 illustrates various variables between participants receiving standard treatment and those undergoing nebulized magnesium sulphate therapy. In terms of age, the mean age for standard treatment participants was 4.671 months, with a standard deviation of 3.5045, while nebulized magnesium sulphate recipients had a slightly lower mean age of 4.587 months and a higher standard deviation of 4.3521. For weight, the standard treatment group had a mean weight of 5.687 kg and a standard deviation of 1.7673, comparable to the nebulized magnesium sulphate group with a mean weight of 5.596 kg and a standard deviation of 1.6297. The Z-score for both groups was similar, indicating participants were, on average, slightly below the mean in terms of weight for age. Notably, the nebulized magnesium sulphate group exhibited a longer average hospital stay (4.41 days) compared to the standard treatment group (3.53 days), implying potential differences in treatment response or protocol adherence between the two groups.

Table 3: Comparison of Variables between Standard Treatment and Nebulized Magnesium Sulphate Groups

Variables		Age in Months	Weight in KG	Z-score	Security	Hospital stay (Day)
Standard Treatment	Mean	4.671	5.687	-1.10		3.53
	N	79	79	79	79	79
	Std. Deviation	3.5045	1.7673	1.257		1.907
Nebulized Magnesium Sulphate	Mean	4.587	5.596	-1.07		4.41
	N	69	69	69	69	69
	Std. Deviation	4.3521	1.6297	1.204		2.130

The table 4 presents a comparative analysis of comorbid conditions, complications, and treatment outcomes between participants receiving standard treatment and those undergoing nebulized magnesium sulphate therapy. In terms of comorbid conditions, participants in both groups had similar frequencies of CHD, CHD(ASD2), CHD(VSD), Complexcsd, Down's CHD, and PCM, with no occurrences of these conditions in the nebulized magnesium sulphate group. However, the majority of participants in both groups had no comorbid conditions (92.4% for standard treatment and 100% for nebulized magnesium sulphate). Similarly, complications were evenly distributed between the groups, with all participants experiencing complications in both groups. Regarding treatment

outcomes, a higher percentage of participants in the nebulized magnesium sulphate group were discharged (100%) compared to the standard treatment group (93.7%). Other outcomes such as Dow, Expired, and Lama were observed in both groups but with minor variations in frequency.

Table 4: Comparison of Comorbid Conditions, Complications, and Outcomes between Standard Treatment and Nebulized Magnesium Sulphate Groups

Variables	Standard Treatment		Nebulized Magnesium Sulphate	
Comorbid	**Frequency**	**Percent**	**Frequency**	**Percent**
CHD	1	1.3	0	0
CHD(ASD2)	1	1.3	0	0
CHD(VSD)	1	1.3	0	0
Complexcsd	1	1.3	0	0
Down'S CHD	1	1.3	0	0
Nil	73	92.4	69	100.0
PCM	1	1.3	0	0
Total	79	100.0	69	100.0
Outcomes	**Frequency**	**Percent**	**Frequency**	**Percent**
Discharge	74	93.7	69	100.0
Dow	2	2.5	0	0
Expired	1	1.3	0	0
Lama	2	2.5	0	0
Total	79	100.0	69	100.0

The comparison between standard treatment and nebulized magnesium sulphate therapy reveals several significant findings (table 5). In terms of Z-score, both groups exhibited similar mean values, with -1.06 for standard treatment and -1.07 for nebulized magnesium sulphate, indicating comparable deviation from the mean in terms of standard deviations. The standard deviations were also quite close, with 1.259 for standard treatment and slightly lower at 1.204 for nebulized magnesium sulphate. However, the correlation between Z-score and treatment group was not significant for either group, with p-values of 0.942 and 0.104 for standard treatment and nebulized magnesium sulphate, respectively. Moving to hospital stay duration, participants in the nebulized magnesium sulphate group had a significantly longer stay compared to those in the standard treatment group, with mean hospital stays of 4.41 days and 3.64 days, respectively. This difference was supported by a significant correlation between hospital stay and treatment group, with a p-value of 0.017 for the standard treatment group and 0.183 for the nebulized magnesium sulphate group.

Table 5: Paired Samples Statistics

Pairs		Mean	N	Std. Deviation	Std. Error Mean	Correlation	P-Value
Z-score	Standard Treatment	-1.06	69	1.259	.152	.104	.942
	Nebulized Magnesium Sulphate	-1.07	69	1.204	.145		
Hospital stay (Day)	Standard Treatment	3.64	69	1.925	.232	.183	.017
	Nebulized Magnesium Sulphate	4.41	69	2.130	.256		

Discussion

The comparison of ages and weights between discharged patients and those receiving Standard Treatment or Nebulized Magnesium Sulphate treatment in acute bronchiolitis management offers insights into potential associations between patient demographics and treatment outcomes. Significant differences in age and weight may reflect variations in disease severity, treatment response, or underlying comorbidities. This observation aligns with previous research indicating the influence of patient characteristics on bronchiolitis outcomes (7, 8). However, caution is warranted due to limitations inherent in the study design and analysis methods,

such as small sample sizes and retrospective data collection. These limitations underscore the need for larger-scale studies with prospective designs to provide more robust evidence and elucidate the complex interplay between patient demographics and treatment responses in acute bronchiolitis (9). According to Haskell et al. (10), future studies can contribute to optimizing treatment strategies and improving outcomes for patients with acute bronchiolitis.

The comparison in current study sheds light on various demographic and clinical variables between participants subjected to standard treatment and those undergoing nebulized magnesium sulphate therapy for acute bronchiolitis. Regarding age, the mean age was slightly lower in the nebulized magnesium sulphate group compared to the standard treatment group, although both exhibited similar standard deviations. This finding aligns with previous studies suggesting that age may influence treatment response and disease severity in bronchiolitis (11). Similarly, while there were no significant differences in mean weight between the two groups, the nebulized magnesium sulphate recipients displayed a broader weight distribution, indicating potential variability in patient characteristics or disease presentation. Notably, the nebulized magnesium sulphate group exhibited a longer hospital stay on average, implying potential complexities in treatment outcomes or disease management strategies (12). These observations underscore the need for further investigation into the efficacy and safety of nebulized magnesium sulphate therapy in acute bronchiolitis management, considering its implications on patient care and clinical decision-making.

A comparative examination of comorbid conditions, complications, and treatment outcomes among participants subjected to standard treatment and nebulized magnesium sulphate therapy for acute bronchiolitis was done in this study. Interestingly, both groups exhibited comparable frequencies of various comorbid conditions, with no occurrences of these conditions noted in the nebulized magnesium sulphate group. The predominance of participants without comorbid conditions aligns with previous research suggesting that acute bronchiolitis primarily affects otherwise healthy infants and young children (13, 14). Furthermore, complications were uniformly distributed between the groups, highlighting the inherent challenges and complexities in managing acute bronchiolitis regardless of treatment modality. Notably, a higher proportion of participants in the nebulized magnesium sulphate group achieved discharge compared to those receiving standard treatment, suggesting potential benefits associated with nebulized magnesium sulphate therapy in improving clinical outcomes and reducing hospital stays (15, 16). Further investigation is warranted to elucidate the underlying mechanisms and confirm the efficacy of nebulized magnesium sulphate therapy in acute bronchiolitis management.

Conclusion

In the comparison between standard therapy and nebulized magnesium sulfate therapy within the study "Efficiency of Nebulized Magnesium Sulphate in Acute Bronchiolitis in Patients Admitted to Pediatric Ward of Bacha Khan Medical Complex/Gajju Khan Medical College Swabi," it can be inferred that both treatments showed comparable frequencies of comorbid conditions, complications, and overall treatment outcomes, such as discharge rates. The Nebulized Magnesium Sulphate therapy group showed relatively better outcomes in terms of avoiding mortality compared to the standard treatment group within the context of acute bronchiolitis management. Despite this, participants in the nebulized magnesium sulfate therapy group displayed a prolonged hospital stay compared to those receiving standard therapy. Therefore, while both treatments may have demonstrated effectiveness in managing acute bronchiolitis, the nebulized magnesium sulfate therapy group may require further investigation to optimize treatment protocols and potentially enhance outcomes within the pediatric.

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