ROLE OF ORAL PREDNISOLONE IN TREATMENT OF ACUTE BRONCHIOLITIS IN CHILDREN WITH AND WITHOUT FAMILY HISTORY OF ATOPY

By

Mostafa Abd El-Azeem Hassan, Mohammed Mahmoud Sayed Younis,

Doaa Hassan Amin Ahmed

Department of Pediatrics, Faculty of Medicine, Al-Azhar University (Assuit)

Corresponding author: Doaa Hassan Amin Ahmed,

Mobile: 01010485149

ABSTRACT

Background: *Bronchiolitis is the most common acute infection of the airways and lungs during the first years of life. It is caused by viruses, the most common being respiratory syncytial virus. The illness starts similar to a cold, with symptoms such as a runny nose, mild fever and cough. It later leads to fast, troubled and often noisy breathing (for example, wheezing).*

Objective: *Detect the efficiency of prednisolone in treatment of bronchiolitis in children with and without family history of atopy.*

Patients and Method: *This was a Prospective observational comparative study was conducted at pediatric department, Faculty of Medicine, Al-Azhar University (Assuit). 100 children between 2month to 2 year presenting with acute bronchiolitis divided into two groups: Group A: children with family history of atopy, Group B: children without family history of atopy. Each group was divided into two subgroup. one subgroup received oral prednisolone 2mg/kg/day In two divided doses for 3 consecutive days with supportive care (nebulization with salbutamol 0.1mg/kg with 2cc normal saline 6 hourly, nebulization with normal saline 2cc 2 hourly and nutritional support in the shape of adequate usual caloric intake according to age of the patient), The other subgroup received only supportive care.*

The primary outcome was the Respiratory Assessment Change Score.

(RACS): *The secondary outcome was length of hospital stay*

Results: *There were insignificant differences between the study groups on admission as regard degree of respiratory distress but after 12, 24 hour there were significant improvement in group A with steroids. As regard Chest X-ray there were insignificant differences between the study groups on admission where p-value 0.893. As regard RDAI score our results showed that there were significant differences between study groups as regard RDAI Score on admission after 12 and 24 hours with best result in group B with steroids after 12 hrs. And group A with steroids after 24 hrs.' and showed*

that there were significant improvement in all groups after 12 and 24 hours. As regard length of hospital stay, there was significant shorter duration of hospital stay in group A with steroids than other groups

Conclusion: *Findings of the study revealed that oral prednisolone shorting the duration of hospital stay in children with acute bronchiolitis with family history of atopy than those without family history of atopy.*

Keywords: *Adrenocorticotropic, bronchopulmonary dysplasia.*

INTRODUCTION

Viral bronchiolitis is one of the major causes of lower respiratory tract infections (RTIs) in children, and usually occurs in those aged less than two years. It is a common illness all over the world responsible for high frequency of hospital admissions, particularly in infants **(Iqbal et al., 2012)**.

Respiratory syncytial virus (RSV) is responsible for almost 80% admissions in hospitals as viral bronchiolitis **(Carande et al., 2016)**, with peak incidence from November to April also human rhinovirus parainfluenza virus and metapneumo virus frequently involved in bronchiolitis with variable seasonality **(Mazur et al., 2015)**.

The key clinical features of viral bronchiolitis are acute respiratory distress with wheezing in a previously well infant and a concurrent history off fever, coryza or cough **(Kini et al., 2001** & **Panitch et al., 2003)**.

The management of bronchiolitis largely depend on the severity of the condition however the best therapeutic approach to the different stage of bronchiolitis is controversial despite the wide array of pharmacological treatment option" oxygen supplementation and supportive therapy to control hydration remain the main stay of treatment **(Ralston et al., 2014)**.

Regarding pharmacological therapy according to the most recent guide line and document on bronchiolitis management there is no evidence supporting the use nebulized adrenaline, salbutamol, and ipratropium bromide, antibiotic, antivirus or systemic or inhaled corticosteroid in practice **(Baraldi et al., 2014)**.

In infants with first episode of wheezing the use of oral steroids is controversial, but these are still being used in bronchiolitis in parental, oral or inhaled forms **(Bria et al., 2016)**.

AIM OF THE STUDY

Detect the efficiency of prednisolone in treatment of bronchiolitis in children with and without family history of atopy.

PATIENTS AND MATERIALS

Study design: Prospective observational comparative study adopted to fulfill the purpose of the study.

Sample size: 100 children between 2month to 2 year presenting with acute bronchiolitis divided into two groups: Group A children with family history of atopy. Group B children without family history of atopy. And each group divided into two subgroup one subgroup received oral prednisolone 2mg/kg/day for 3 consecutive days with supportive care (nebulization with salbutamol 0.1mg/kg with 2cc normal saline 6 hourly, nebulization with normal saline 2cc 2 hourly and nutritional support in the shape of adequate usual caloric intake according to age of the patient)

The other subgroup received only supportive care.

Study population: The included study populations are children with acute bronchiolitis in sohage teaching hospital

Inclusion criteria: Age, 2month to 2year presenting with acute bronchiolitis with moderate respiratory distress.

Exclusion criteria: Bronchiolitis with mild or sever respiratory distress, Sever acute malnutrition, Pneumonia, History of TB, Cystic fibrosis, Immunodeficiency, Chronic illness, Genetic disease or syndrome, History of treatment with prednisolone and bronchodilator were excluded.

Method:

The clinical data of patients fulfilling the inclusion criteria evaluated as follow:

Clinical data: Careful history taken from patient relative include age, history of cough, breathing difficulty with fast breathing, history of atopy in the family, intake of prednisolone or any treatment.

Clinical examination include: General examination to exclude sign of respiratory distress as nasal flaring, grunting, sign of dehydration chest examination to determine tachypnea ,subcostal and intercostal retraction, expiratory wheeze by auscultation heart and abdominal examination.

Laboratory investigation: Complete blood count and Chest x-ray.

Ethical consideration: The study explained to all participants with oral consents of the parents of the

patient safter approval of the local Ethical committee and written consent will be obtained from hospital administration.

Statistical analysis of the data:

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp) Qualitative data were described using number and percent. The Kolmogorov-Smirnov test was used to verify the normality of distribution Quantitative data were described using range (minimum and maximum), mean, standard deviation, median and interquartile range (IQR). Significance of the obtained results was judged at the 5% level.

The used tests were:

Chi-square test: For categorical variables, to compare between different groups.

Monte Carlo correction: Correction for chi-square when more than 20% of the cells have expected count less than 5.

F-test (ANOVA): For normally distributed quantitative variables, to compare between more than two groups, and Post Hoc test (Tukey) for pairwise comparisons.

ANOVA with repeated measures: For normally distributed quantitative variables, to compare between more than two periods or stages, and Post Hoc test (Bonferroni adjusted) for pairwise comparisons.

Kruskal Wallis test: For abnormally distributed quantitative variables, to compare between more than two studied groups and Post Hoc (Dunn's multiple comparisons test) for pairwise comparisons.

Friedman test: For binary qualitative variables, to compare between more than two periods or stages and Post Hoc Test (Dunn's) for pairwise comparisons.

RESULTS

Table (1): Comparison between Group A (children with acute bronchiolitis with family history of atopy) and Group B (children with acute bronchiolitis without family history of atopy) according to demographic data

	Group A (bronchiolitis with family history of atopy)				Group B (bronchiolitis without family history of atopy)				Test of Sig.	P
	Without steroids (n = 25)		With steroids (n = 25)		Without steroids (n = 25)		With steroids (n = 25)			
	No.	%	No.	%	No.	%	No.	%		
Sex										
Male	14	56.0	12	48.0	12	48.0	12	48.0	χ^2= 0.480	0.923
Female	11	44.0	13	52.0	13	52.0	13	52.0		
Age (months)										
Mean ± SD.	14.16± 5.94		13.52±6.72		13.68±5.89		13.44±5.99		F= 0.069	0.976

IQR: Inter quartile range,
SD: Standard deviation,
χ2: Chi square test,
F: F for ANOVA test,
p: p value for comparing between the studied groups.

This table shows that there was an insignificant difference between groups as regard demographic p –value 0.923, 0.976

Table (2): Comparison between .Group A (children with acute bronchiolitis with family history of atopy) and Group B (children with acute bronchiolitis without family history of atopy) according to clinical data

	Group A (bronchiolitis with family history of atopy)				Group B (bronchiolitis without family history of atopy)				χ^2	P
	Without steroids (n = 25)		With steroids (n = 25)		Without steroids (n = 25)		With steroids (n = 25)			
	No.	%	No.	%	No.	%	No.	%		
Main complain										
Cough	5	20.0	8	32.0	10	40.0	10	40.0	3.527	$^{MC}p=$ 0.766
Breathing difficulties	18	72.0	15	60.0	13	52.0	13	52.0		
Cyanosis	2	8.0	2	8.0	2	8.0	2	8.0		
Past history of atopy										
positive	12	48.0	10	40.0	10	40.0	10	40.0	0.493	0.921
Negative	13	52.0	15	60.0	15	60.0	15	60.0		
Duration of illness (hrs.) Mean ± SD	16.32±7.74		16.24±7.72		16.24±7.72		16.24±7.72		0.012	1.000
Length of hospital stay (hrs.) Mean ± SD.	37.64±13.74		30.0±14.04		44.80±12.89		47.60±12.69		22.575*	<0.001*

χ2: Chi square test,
MC: Monte Carlo,
p: p value for comparing between the studied groups,
IQR: Inter quartile range,
SD: Standard deviation,
H: H for Kruskal Wallis test.

This table shows that there was insignificant differences between groups as regard main complain, past history p –value 0.923, 0.976 and also shows that there was an insignificant difference between groups as regard Duration of illness p – value 1.000.

There was significant shorter duration of hospital stay in group A with steroid than other group.

Table (3): Comparison between Group A (children with acute bronchiolitis with family history of atopy) and Group B (children with acute bronchiolitis without family history of atopy) according to respiratory rate

	Respiratory rate			F	P
	On admission	After 12h	After 24h		
Group A without steroids(n = 25)					
Mean ± SD.	75.88 ± 3.71	75.80 ± 3.55	75.80 ± 3.55	0.048	0.953
Group A with steroids(n = 25)					
Mean ± SD.	75.72 ± 3.55	58.16 ± 3.51	56.56 ± 4.35	283.390*	<0.001*
Sig. bet. periods.	$p_1<0.001^*, p_2<0.001^*, p_3=0.088$				
Group B without steroids(n = 25)					
Mean ± SD.	75.40 ± 3.63	75.32 ± 3.68	75.32 ± 3.68	0.277	0.7259
Group B with steroids(n = 25)					
Mean ± SD.	75.40 ± 3.63	75.72 ± 3.21	74.12 ± 4.13	4.476*	0.016*
Sig. bet. Periods.	$p_1=0.672, p_2=0.210, p_3=0.042^*$				

IQR: Inter quartile range, SD: Standard deviation.
F: F test (ANOVA) with repeated measures, Sig. bet. Periods was done using Post Hoc Test (adjusted Bonferroni).
p: p value for comparing between the studied periods.
p1: p value for comparing between on admission and after 12h.
p2: p value for comparing between on admission and after 24h.
p3: p value for comparing between after12h and after 24h.
*: Statistically significant at $p \leq 0.05$.

This table shows that respiratory rate significantly improved in group A, B with steroids.

Table (4): Comparison between the three studied periods according to heart rate in each group

	Heart rate			F	P
	On admission	**After 12h**	**After 24h**		
Group A without steroids(n = 25)					
Mean ± SD.	152.32 ± 7.54	151.44 ± 7.25	151.44 ± 7.25	3.612	0.069
Group A with steroids(n = 25)					
Mean ± SD.	151.96 ± 7.33	139.04 ± 8.13	136.48 ± 10.70	42.926*	<0.001*
Sig. bet. periods.	$p_1<0.001^*, p_2<0.001^*, p_3=0.264$				
Group B without steroids(n = 25)					
Mean ± SD.	151.96 ± 7.33	145.08 ± 8.47	145.08 ± 8.47	26.477*	<0.001*
Sig. bet. periods.	$p_1<0.001^*, p_2<0.001^*, p_3=–$				
Group B with steroids(n = 25)					
Mean ± SD.	151.96 ± 7.33	143.88 ± 9.77	140.28 ± 12.69	17.926*	<0.001*
Sig. bet. periods.	$p_1<0.001^*, p_2<0.001^*, p_3=0.141$				

IQR: Inter quartile range,
SD: Standard deviation,
F: F test (ANOVA) with repeated measures,
Sig. bet. Periods: was done using Post Hoc Test (adjusted Bonferroni),
p: p value for comparing between the studied periods,
p1: p value for comparing between on admission and after 12h,
p2: p value for comparing between on admission and after 24h,
p3: p value for comparing between after 12h and after 24h,
*: Statistically significant at $p \leq 0.05$.

This table shows that heart rate significantly improved in group A with steroids and group B with and without steroids.

Table (5): Comparison between the three studied periods according to O2 saturation in each group

	O_2 saturation			F	P
	On admission	After 12h	After 24h		
Group A without steroids(n = 25)					
Mean ± SD.	91.20 ± 2.24	91.20 ± 1.83	91.20 ± 1.83	0.000	1.000
Group A with steroids(n = 25					
Mean ± SD.	93.32 ± 2.51	95.48 ± 1.08	95.60 ± 1.04	20.941*	<0.001*
Sig. bet. periods.	p_1<0.001*,p_2<0.001*,p_3=0.555				
Group B without steroids(n = 25)					
Mean ± SD.	93.32 ± 2.51	93.44 ± 2.33	93.44 ± 2.33	1.301	0.265
Group B with steroids(n = 25)					
Mean ± SD.	93.32 ± 2.51	93.36 ± 2.34	93.68 ± 1.75	2.185	0.139

IQR: Inter quartile range,
SD: Standard deviation.
F: F test (ANOVA) with repeated measures,
Sig. bet. Periods: was done using Post Hoc Test (adjusted Bonferroni).
p: p value for comparing between the studied periods,
p1: p value for comparing between on admission and after 12h,
p2: p value for comparing between on admission and after 24h,
p3: p value for comparing between after 12h and after 24h,
*: Statistically significant at $p \leq 0.05$.

This table shows that there was significant improvement in group A with steroids after 12, 24 hours.

Table (6): Comparison between the three studied periods according to degree of RD in each group

	Degree of RD							
	On admission		**After 12h**		**After 24h**		**Fr**	**P**
	No.	**%**	**No.**	**%**	**No.**	**%**		
Group A without steroids(n = 25)								
Grade I	0	0.0	2	8.0	2	8.0	3.846	0.146
Grade II	13	52.0	14	56.0	14	56.0		
Grade III	12	48.0	9	36.0	9	36.0		
Group A with steroids(n = 25)								
Grade I	0	0.0	11	44.0	12	48.0	30.125*	<0.001*
Grade II	13	52.0	14	56.0	13	52.0		
Grade III	12	48.0	0	0.0	0	0.0		
Sig. bet. periods.	p_1=0.001*,p_2=0.001*,p_3=0.832							
Group B without steroids(n = 25)								
Grade I	0	0.0	0	0.0	0	0.0	0.000	1.000
Grade II	16	64.0	16	64.0	16	64.0		
Grade III	9	36.0	9	36.0	9	36.0		
Group B with steroids(n = 25)								
Grade I	0	0.0	0	0.0	0	0.0	4.667	0.097
Grade II	16	64.0	15	60.0	18	72.0		
Grade III	9	36.0	10	40.0	7	28.0		

Fr: Friedman test, Sig. bet. periods was done using Post Hoc Test (Dunn's),
p: p value for comparing between the studied periods,
p1: p value for comparing between on admission and after 12h,
p2: p value for comparing between on admission and after 24h,
p3: p value for comparing between after 12h and after 24h,
*: Statistically significant at $p \leq 0.05$.

This table shows that only group A with steroids showed significant improvement after 12, 24 hrs.

Table (7): Comparison between Group A (children with acute bronchiolitis with family history of atopy) and Group B (children with acute bronchiolitis without family history of atopy) according to chest-ray on admission

	Group A (bronchiolitis with family history of atopy)				Group B (bronchiolitis without family history of atopy)					
Chest-ray on admission	Without steroids (n = 25)		With steroids (n = 25)		Without steroids (n = 25)		With steroids (n = 25)		χ^2	^{MC}p
	No.	%	No.	%	No.	%	No.	%		
Normal	0	0.0	0	0.0	1	4.0	1	4.0	4.854	0.893
Hyperinflation	15	60.0	16	64.0	13	52.0	13	52.0		
Atelectasis	4	16.0	4	16.0	7	28.0	7	28.0		
Consolidation	6	24.0	5	20.0	4	16.0	4	16.0		

χ2: Chi square test MC: Monte Carlo
p: p value for comparing between the studied groups

This table shows that there were insignificant differences between study groups on admission as regard Chest-ray on admission p-value 0.893.

Table (8): Comparison between the three studied periods according to RDAI score in each group

	RDAI Score			F	P
	On admission	After 12h	After 24h		
Group A without steroids(n = 25)					
Mean ± SD.	6.85 ± 0.04	6.57 ± 0.08	5.23 ± 0.32	533.360*	<0.001*
Sig. bet. periods.	$p_1<0.001^*, p_2<0.001^*, p_3<0.001^*$				
Group A with steroids(n = 25)					
Mean ± SD.	6.91 ± 0.08	6.48 ± 0.04	1.51 ± 0.12	25217.84*	<0.001*
Sig. bet. periods.	$p_1<0.001^*, p_2<0.001^*, p_3<0.001^*$				
Group B without steroids(n = 25)					
Mean ± SD.	6.82 ± 0.04	6.03 ± 0.11	4.25 ± 0.12	4690.390*	<0.001*
Sig. bet. periods.	$p_1<0.001^*, p_2<0.001^*, p_3<0.001^*$				
Group B with steroids(n = 25)					
Mean ± SD.	6.75 ± 0.05	5.88 ± 0.13	3.50 ± 0.11	7482.976*	<0.001*
Sig. bet. periods.	$p_1<0.001^*, p_2<0.001^*, p_3<0.001^*$				

IQR: Inter quartile range,
SD: Standard deviation,
F: F test (ANOVA) with repeated measures, Sig. bet. periods was done using Post Hoc Test (adjusted Bonferroni),
p: p value for comparing between the studied periods,
p1: p value for comparing between on admission and after 12h,
p2: p value for comparing between on admission and after 24h,
p3: p value for comparing between after 12h and after 24h,
*: Statistically significant at $p \leq 0.05$.

This table shows that there was significant improvement in all groups after 12 and 24 hours.

DISCUSSION

Bronchiolitis has been intensively studied in literature from various angles including its management and the main stay of treatment remains primary supportive .Role of corticosteroid in bronchiolitis has remained controversial.

In the current study age in Group (A) was ranged between 3.0 – 24.0 months (without steroids) and (with steroids) was ranged between 2.0 – 24.0 months, while in Group (B) was ranged between 2.0 – 24.0 (without steroids) months and was ranged

between 2.0 – 24.0 (with steroids) months .As regard comparison of mean age in months of studied children's groups There were no statistically significant differences between them as shown in **table (1)**.

As regard main complain (Cough, Breathing difficulties, Cyanosis) and past history, there was insignificant differences between groups as shown in t**able (2)**.

In our study as regard duration of illness, there were insignificant differences between the different studied groups as shown in **table (2)**.

Our results were supported by study of **Baig et al.,** as They found that patients in the steroid subgroup got discharged at 24 hours, while only 8(22%) were discharged in the non-steroid subgroup. In non-atopic group, no significant improvement in duration of illness was observed **(Baig et al., 2019)**.

As regard length of hospital stay, there was significant shorter duration of hospital stay in group A with steroids than other groups as shown in **table (2)**.

Our results were supported by study of **(Ahmad et al., 2019)** as they found that length of hospital stay was <7days in 31 (38.8%) in prednisolone and placebo 8(10%).

The result of **Panickar et al.,** was against our result as they found no significant difference in the duration of hospitalization between the placebo group and the prednisolone group or in the interval between hospital l admission and signoff for discharge by a physician **(Panickar et al., 2009)**.

Furthermore ,the Systematic Review of **Tjosvold et al.,** found that Glucocorticoids did not significantly reduce outpatient admissions by days 1 and 7 when compared to placebo (pooled risk ratios (RRs) 0.92; 95% confidence interval (CI) 0.78 to 1.08 and 0.86; 95% CI 0.7 to 1.06, respectively). There was no benefit in LOS for inpatients (mean difference - 0.18 days; 95% CI - 0.39 to 0.04) **(Tjosvold et al., 2013)**.

In our study we found that as regard respiratory rate in Comparison between the different studied groups, there were insignificant differences between study groups on admission but after 12, 24 hour there was significant improvement in group A, B with steroids as shown in **table (3)**.

In this study we found as regard Heart rate there were insignificant differences between

study groups on admission but after 12, 24 hour there was significant improvement in group A with steroids and group B with and without steroids.as shown in **table (4)**.

Also, we found that O2 saturation after 12, 24 hour show significant improvement in group A with steroids and without improvement in other groups as shown in **table (5)**.

In contrast to our result **(Ahmad et al., 2019)** found that Majority of patients in prednisolone group 28(35%) had oxygen saturation 90% while majority of patients in placebo group 28(35%) had oxygen saturation >90% (p=0.001) after 24 hours.

In our study we found insignificant differences between study groups on admission as regard degree of respiratory distress but after 12, 24 hour there were significant improvement in group A with steroids after 12 , 24 hrs. As shown in **table (6)**.

The study of **Baig et al.,** supported our results, as they found significant respiratory distress difference observed between steroid and non-steroid subgroups at 24 hours (p=0.001) However they found that Oral prednisolone in bronchiolitis only effective in patients with family history of atopy **(Baig et al., 2019)**.

As regard Chest X-ray there were insignificant differences between study groups on admission where p-value 0.893 as shown in **table (7)**.

As regard Respiratory distress assessment instrument (RDAI) score our results found that there was significant differences between study groups as regard RDAI Score on admission, after 12 and 24 hours with best result in group B with steroids after 12 hrs and group A with steroids after 24 hrs and showed that there was significant improvement in all groups after 12 and 24 hours as shown in **table (8)**.

In contrast, the study of **Mesquita et al.,** was against our results.as They found that there were no differences in RDAI, heart and respiratory rate and SpO2 between groups after the 1st and 4th hours. **(Mesquita et al., 2009)**.

CONCLUSION

Findings of the study revealed that oral prednisolone shortting the duration of hospital stay in children with acute bronchiolitis with family history of atopy than those without family history of atopy.

RECOMMENDATION

Further studies recommended on large sample size, large geographical scale to emphasize our conclusion, adequately powered clinical trials focused on distinct and well-defined disease phenotypes and using pharmacologically sufficient doses of corticosteroids in atopic children with bronchiolitis

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دورالبريدينزيلون الفموي في التهاب القصيبات الهوائية الحاد في الاطفال مع وبدون تاريخ عائلي من التأتب

مصطفي عبد العظيم حسن، محمد محمود سيد يونس، دعاء حسن امين احمد

قسم الاطفال، كليه الطب، جامعه الازهر اسيوط

خلفية البحث: التهاب القصيبات هو أكثر أنواع العدوى الحادة شيوعًا التي تصيب الشعب الهوائية والرئتين خلال السنوات الأولى من الحياة. تسببه الفيروسات، وأكثرها شيوعًا هو الفيروس المخلوي التنفسي. يبدأ المرض بشكل مشابه لنزلات البرد مع أعراض مثل سيلان الأنف وحمى خفيفة وسعال. ويؤدي لاحقًا إلى تنفس سريع ومضطرب وصاخب في كثير من الأحيان (مثل الأزيز). في حين أن المرض غالبًا ما يكون خفيفًا بالنسبة لمعظم الرضع والأطفال الصغار، إلا أنه سبب رئيسي للمرض السريري وعبء الصحة المالية في جميع أنحاء العالم. ارتفع عدد حالات الاستشفاء في البلدان المرتفعة الدخل، وهناك استخدام كبير للرعاية الصحية وقد يرتبط التهاب القصيبات باضطرابات الصفير في مرحلة ما قبل المدرسة ويصاب الطفل لاحقًا بالربو.

الهدف من البحث: كان الهدف الرئيسي من هذه الدراسة هو الكشف عن كفاءة بريدنيزولون في علاج التهاب القصيبات مع وبدون تاريخ عائلي من التأتب.

المرضي: كانت هذه الدراسة الاستباقية مقارنة بالملاحظة أجريت في قسم طب الأطفال، كلية الطب، كلية الطب، جامعة الأزهر (أسيوط). 100 طفل تتراوح أعمارهم بين شهرين وسنتين يعانون من التهاب القصيبات الحاد مقسمة إلى مجموعتين: المجموعة أ: طفل لديه تاريخ عائلي من التأتب، المجموعة ب:

طفل ليس لديه تاريخ عائلي للإصابة بالتأتب. تم تقسيم كل مجموعة إلى قسمين، نصف نصف سيحصل على دواء بريدينسيولون عن طريق الفم 2 مجم/كجم/يوم على جرعتين مقسمتين لمدة 3 أيام متتالية مع رعاية داعمة (إرذاذ مع سالبوتامول 0.1 مجم/كجم مع محلول ملحي عادي 2 سم 6 كل ساعة، إرذاذ بمحلول ملحي عادي 2 سم 2 كل ساعة ودعم غذائي على شكل كمية كافية من السعرات الحرارية المعتادة حسب عمر المريض)، وسيتلقى النصف الآخر رعاية داعمة فقط.

النتائج: تراوح العمر في المجموعة (أ) بين 3.0 - 24.0 شهرًا (بدون ستيرويد) بمتوسط14.16 ± 5.94 و (مع ستيرويد) تراوحت بين 2.0 - 24.0 شهرًا بمتوسط13.52 ± 6.72 شهرًا، بينما في المجموعة (ب) تراوحت بين 2.0 - 24.0 شهرًا (بدون المنشطات) بمتوسط 13.68 ± 5.89 شهرًا وتراوحت بين 2.0 - 24.0 شهرًا (مع المنشطات) بمتوسط ± 13.44 دينارًا بحرينيًا ± 5.99. لم تكن هناك فروق ذات دلالة إحصائية بين المجموعات. فيما يتعلق بالشكوى الرئيسية (السعال، صعوبات التنفس، الزرقة) والتاريخ الماضي، كانت هناك اختلافات طفيفة بين المجموعات. فيما يتعلق بمدة المرض، لم تكن هناك فروق ذات دلالة إحصائية بين المجموعات المدروسة المختلفة.

الخلاصة: بناءً على النتائج التي توصلنا إليها، نوصي بإجراء مزيد من الدراسات حول حجم العينة الأكبر وعلى نطاق جغرافي كبير للتأكيد على استنتاجنا.