Synopsis

D Code: D5252R00001
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Study title：

Patients' Compliance to home nebulizer therapy for children's asthma in China

An observational study to investigate the compliance of home nebulizer therapy among children aged 0-14 years old clinically diagnosed with asthma

Participating sites：

12 sites across Chinese mainland.

Study duration：

10 months

Date of Fist Subject Enrolled: 25 July 2017

Date of Last Subject Completing Observation: 9 May 2018

Objective：

(1) Primary objective:

-To investigate the treatment compliance to home nebulizer therapy in children

(2) Secondary objectives:

-To identify factors associated with treatment compliance

-To evaluate asthma control status according to GINA definition (GINA 2016 update) overall and by different compliance levels

-To see the agreement of asthma control status between Test for Respiratory and Asthma Control in Kids (TRACK) and GINA definition

Study design：

Multi-center, observational, prospective study

Inclusion criteria：

Patients who:

1. Aged 0-14 years old, clinical diagnosed as asthma according to Chinese pediatric asthma diagnosis and treatment guideline
2. Prescribed home nebulizer therapy for at least 3 months
3. The guardians must sign the Informed Consent Form; patients who can make decision by him/herself must also sign the Informed Consent Form

Exclusion criteria：

Patients who:

1. Allergy to any inhaler cortical steroid
2. Presenting with differential diagnosis of asthma such as congenital heart disease, gastro-esophageal

reflux, bronchopulmonary dysplasia, bronchiolitis obliterans, etc.
3. Parents/Guardian have problem in expression, understanding, writing and reading in Chinese judged by the investigator
4. Patients are participating other on-going clinical studies
5. Patients with other diseases that may interfere the study results judged by the investigators

Number of subjects：

510 pediatric asthma patients

Efficacy variables：

Not applicable.

Safety variable：

Not applicable.

Efficacy assessment criteria：

Not applicable.

Statistical methods：

Full Analysis Set (FAS) will be the primary analysis set. All enrolled subjects who fulfil the inclusion/exclusion criteria will be included in FAS. FAS will be used for all analyses. No imputation of missing data will be used. All statistical analyses will be carried out on non-missing data only.

The statistical method for primary endpoint and secondary endpoints will be primarily descriptive in nature. For each endpoint, continuous data will be summarized by number of patients, mean, standard deviation, median, 1st and 3rd quantile, minimum and maximum. Categorical data will be summarized by frequency and percentages. 95% CIs will be calculated as appropriate.

Results：

Primary variable —— Median treatment compliance (%) monitored by electronic chips
The full analysis set included 510 patients. Median treatment adherence reported by electronic monitoring devices was 69.9%.

Secondary variables:
—— Proportion of patients in different treatment compliance levels (<50%, 50 %≤-< 80%, 80%≤-≤120%, >120%) monitored by electric chips
According to the treatment adherence reported by electronic monitoring chips, the proportions of patients in different treatment compliance levels <50%, 50 %≤-< 80%, 80%≤-≤120%, >120% are 22.8%, 44.7%, 31.3% and 1.2%, respectively.

—— Median treatment compliance (%) reported by caregivers
Median caregiver-reported adherence was 77.9%.

—— Proportion of patients in difference compliance levels reported by caregivers

The proportions of patients in different treatment compliance levels <50%, 50 %≤-< 80%, 80%≤-≤120%, >120% are 23.1%, 30.0%, 45.4% and 1.5%, respectively.

——Factors associated with treatment compliance

A multivariate linear regression analysis showed that increased time between asthma diagnosis and study enrolment was a significant predictor of increased adherence to asthma medication (coefficient: 0.01; p = 0.0138, 95% confidence interval [CI]: 0.00, 0.01).

—— Proportion of patients by severity

At baseline (Visit 1), 300 (59.1%), 173 (34.1%) and 35 (6.9%) patients had mild, moderate and severe asthma, respectively. At 12 weeks (Visit 4), the proportion of patients with mild asthma had increased to 96.0%, and the proportion of patients with moderate and severe asthma had decreased to 3.8% and 0.3%, respectively.

——Asthma control status according to GINA definition (GINA 2016 update) overall and by different compliance levels

GINA 2016-defined asthma control improved over the course of the study. The proportion of patients with well-controlled asthma increased from 12.0% at baseline (Visit 1) to 51.4%, 67.0% and 77.5% at Visits 2, 3 and 4, respectively. For patients of different treatment compliance levels <50%, 50 %≤-< 80%, 80%≤-≤120%, >120%, well-controlled rates at 12 weeks (Visit 4) were 84.2%, 78.7%, 72.4% and 75%, respectively.

——Factors associated with control levels

Length of time between asthma diagnosis and study enrolment was a predictive factor for good asthma control (odds ratio [OR] = 1.001, p = 0.0408, 95% CI: 1.000, 1.002). The attitudes of caregivers towards asthma medication was also a predictor for asthma control:

- Strongly agreeing with ‘In the near future, it may become difficult for me to let my child take their asthma medication’ was a significant predictor for poor asthma control (OR = 0.09, p = 0.0462, 95% CI: 0.01, 0.96)
- Disagreeing with ‘Medication does not help or is not necessary for long-term use’ was a significant predictor for good asthma control (OR = 3.08, p = 0.0224, 95% CI: 1.17, 8.09)

——The proportion of asthma control status according to TRACK for subjects under 5 years old

For patients under 5 years old, TRACK-defined asthma control improved over the course of the study. The proportion of patients with controlled asthma increased from baseline (Visit 1) 25.9% to 55.6%, 65.6% and 76.4% at Visits 2, 3 and 4, respectively.

——Agreement of asthma control status between Test for Respiratory and Asthma Control

in Kids (TRACK) and GINA definition
To evaluate the agreement of control status assessed using GINA and using TRACK, the weighted Kappa coefficient was estimated in the patients who had both assessments. The agreement of control status assessed using GINA and TRACK kept increasing from visit 1 to visit 3 and decreased a little from visit 3 to visit 4. The proportion of controlled status assessed using GINA and TRACK looked similar.

Conclusion:
Results of this study suggest that the rate of treatment adherence to three months home nebulizer treatment in children is good in China. However, caregiver-reported adherence may overestimate actual treatment adherence and was higher than that measured by electronic monitoring devices. In this study, longer disease course was significantly associated with better adherence to treatment. Asthmatic control levels improved with the extension of treatment. Home nebulizer therapy is an alternative treatment for children with asthma in China.