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VALIDATION OF HINDI CLASSIFICATION OF ASTHMA SEVERITY FOR HOME-BASED MONITORING OF CHILDHOOD ASTHMA SEVERITY BY PARENTS THROUGH PILOT STUDY

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ABSTRACT

Background- Aim-Validation of Hindi classification of asthma severity diary (HACD) for home-based monitoring of asthma severity by parents **Method And Material:** The pilot study was carried out in 30 children aged 4 to 12 years who have a diagnosis of asthma and their parents in Paediatrics (OPD) or ward of GMC Gondia MS. as it is a pilot study, and minimum sample size required for a pilot study is 30. Preparation of symptoms diary (HACD) and classification of asthma on basis of symptom diary which is not exact modification of GINA but is based on GINA guidelines. after written consent and applying exclusion criteria patient's symptoms data at daytime /night-time were recorded and charted on diary for 30 days and grading of asthma done which compared with doctors grading. parent socioeconomic data evaluated with regard to correct asthma severity grading. Statistical analysis will be done on the basis of number of parents charting symptom diary correctly. **Result:** In our study maximum patient were in age group of 6-10years with male outnumbering the female (53.3%).83.3% parents classified asthma severity correctly. Study showed that male parents (100%), age group of 26-35 years (90%), parents with higher education (95%) and higher socioeconomic status (95%) have higher percentage of correctly charting symptom diary. **Conclusion:** HACD is a simple easy to understand, sensitive and specific tool for classifying different Grades of asthma severity. 5 mins training programme is required teaching parents.

Keyword: Asthma, HACD, GINA(global initiative for asthma), parents

INTRODUCTION

Asthma is a heterogeneous illness, characterised by chronic airway inflammation resulting in airways obstruction. It is most common chronic illness of childhood.⁽¹⁾ It is defined a chronic inflammatory condition of the airway associated with reversible airway obstruction.⁽²⁾

It was estimated that more than 339 million people had asthma globally in 2016.⁽³⁾ According to WHO estimates, death rate due to asthma at global level was 4,17,918 and 24.8 million DALY was attributable to asthma.⁽⁴⁾ Global Initiative on Asthma (GINA) 2006 guidelines highlighted that involvement of parents of asthmatic patient will be helpful for effective control of asthma. It can be done by proper interaction between doctor and caregiver, explaining parents the symptomatology of asthma, various precipitating factors of asthma, classification of asthma in simpler and understandable way.⁽⁵⁾

revised 2006 GINA guidelines highlighted the classification of asthma according to the level of disease control not according to disease severity and emphasized that effective management of asthma involves partnership between patient or his/her caregiver and doctor. Parents can involve in asthma control through various ways, one such approach is classification of asthma severity by parents. For this everything related to disease should be explained to parents in easily understandable manner which can be in their local language. Various, different classification systems (NAEPP, Cockcroft and Swystun.^(6,7) are available for asthma which can be modified for parents so, as to easily understand and classify asthma these classifications can be modified or can be prepared in locally understandable language for parents, and they can be explained to keep record of daily symptoms of patients which can be labelled as asthma diary. Various such symptom diaries are available like Monkey's symptom diary used in UK and Symptom diary of Australia. Multiple different studies are conducted in past where validation of such symptom diary was done and shown a correlation these asthma diaries were of great importance in achieving good asthma control. Various Study by NC Santanello.^(8,9) in 1999 and 2001 validated asthma symptom diary for asthma intervention studies.

NC Santanello *et al.*,⁽¹⁰⁾ Adesua Y Okupa⁽¹¹⁾ conducted a study involving paediatric asthma care giver for various duration (3-4 weeks) involving children aged 2 to 5 years based on A symptoms. GINA Report 2016 for children insist that the parent should be taught understanding of asthma severity so that the home management of asthma by them becomes easier to a certain extent; though it does not specify the exact way to go about it.

So that in this pilot study, asthma symptoms modified in Hindi language and daily symptom recording of asthma had done by parents in diary and on basis of that classification of asthma severity been done. further parent classification of asthma severity correlated with doctors diagnosis of asthma severity and variable of parent characteristics been studied.

MATERIALS AND METHODS

Pilot study was conducted after ethical committee (No.GMCG/Pharmac/IEC/37/2023) approval at Out Patients Department (OPD) or ward of pediatric department , Govt. Medical College Gondia Maharashtra of children with asthma in age group of 4 year to 12 year with their parent/caregivers for duration of 1 month of January 2024 .parents were explained about the study, written informed consent was taken from parents. Symptoms include cold (running nose, blocked nose), cough (wet, dry), fever, wheezing (musical noisy breathing sound on breathing), difficulty in breathing in Day time (10 am- 10pm) and night time (10pm- 10am) are recorded in diary daily even if symptoms present or absent. . For symptom present (√), severe grade symptom (*), no symptom (0) is marked. the flow chart (1) explained parent training and instructions.

Parent grading was matched with doctors grading based on clinical criteria which is considered as gold standard diagnosis for asthma grading. Doctor grading was as Mild Intermittent Asthma which corresponds to Grade 1(kabhi kabhi) of parents grading, Mild Persistent Asthma corresponding to Grade 2 (bar bar) of parents grading system, Moderate Persistent Asthma which corresponds to Grade 3(prati din) and Severe Persistent Asthma corresponds to Grade 4 (prati rat) of parents grading. Correlation of parental age, gender, educational status and socio-economic status of parents with charting of symptom diary was studied

Exclusion Criteria

- 1.Parents who are unable to understand, read, write Hindi language.
- 2.Parents who are doctors.

Study Type

Pilot study aimed to validate a classification system by means of face and formative validity by conducting a post training assessment of parents of asthmatic children.

Sample Size

As it is a pilot study, and minimum sample size required for a pilot study is 30, we take sample size of 30, minimum cluster

size.

Minimum sample size proposed for face and formative validation is 10.

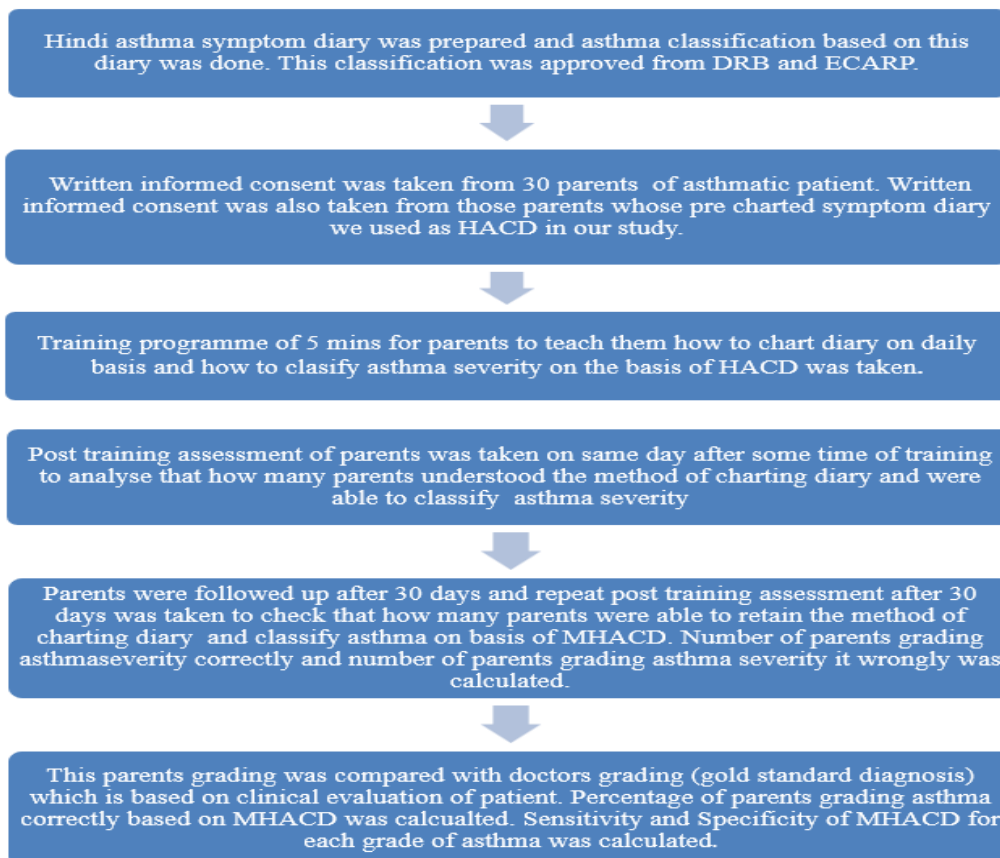
We will be using heuristic method of face validation.

Statistical Analysis

Statistical analysis will be done based on number of parents classify asthma grading correctly based on HACD.

More than 80% parents should classify grade of asthma correctly.

RESEARCH METHODOLOGY: -flow chart -1



Asthma and 1 as Mild Persistent Asthma (sensitivity 90%, specificity 100%). Doctor's grading was Mild Persistent Asthma for 15 subjects, in which 2 subjects were graded by parent's as Mild Intermittent Asthma, 12 as Mild Persistent Asthma and 1 as Moderate Persistent Asthma (sensitivity 80%, specificity 100%). For 1 subject, both doctor and parent graded was Moderate Persistent Asthma (sensitivity and specificity 100%). Out of 3 subjects for whom doctor's grading was Severe Persistent Asthma, 2 subjects were graded by parent's as Severe Persistent Asthma and 1 as Moderate Persistent Asthma (sensitivity 66.6%, specificity 100%).

Demographic and socio-economic characteristic of parent of children with asthma

In the present study, along with children, parent's age data were also included. Majority of the parents were 26-30 years old (46.7 %) and only 1 parent (3.3 %) was more than 35 years. 6 parents were 21-25 years old (20 %) and 9 (30 %) were 31-35 years old, the study showed that maximum parents belonging to age group of 26-30 years graded asthma correctly (92.8%) followed by parents of age group 31-35 years (88.8%). For parents of age group 21-25 years 4 graded it correctly and 2 parents could not grade correctly. None of the parent belonging to age group more than 35 year could grade asthma correctly.

In the present study, out of 30 parents, Majority of parents i.e. 24 (80 %) were female and only 6 (20 %) were male parents. Demographic characteristic of parents and percentage of parent correctly grading severity of asthma shown in table -3

DISCUSSION

Asthma is a chronic, heterogeneous, characterised by wheeze, cough, dyspnoea and chest tightness, variable airways obstruction and Bronchial Hyper Responsiveness (BHR) (12,13). It has an unacceptable burden on both healthcare systems, and the society.⁽¹⁴⁾

Asthma is highly variable so accordingly therapy should be adjusted (step up or step down). The criteria for classification of asthma severity by global initiative for asthma (GINA), it should be feasible and can be easily implementable (15).

The GINA Report 2016 for children insist that the parent should be taught understanding of asthma severity so that the home management of asthma by them becomes easier to a certain extent; though it does not specify the exact way to go about it (16). For this various tool were prepared and one was asthma breathing diary. Asthma breathing diary is a daily or weekly record (based on type of diary) of asthma symptoms, their exacerbating factor, association, or control with use of medication, etc. It was thought that if such asthma diaries are available for parents in easily understandable language like in their local language then it will be beneficial, and more and more parents will be aware about disease. Different countries had made such symptom diary and validated these diaries among their population.⁽¹⁷⁾ we prepared a Hindi Asthma Classification Dairy (HACD). This HACD is 30 days dairy, as asthma control and severity assessment were done on basis of 1 month symptoms as per GINA guidelines.⁽¹⁶⁾ Symptoms included in HACD are those symptoms which are used for assessing asthma severity according to GINA. HACD is not exactly based on GINA 1993 asthma classification but it is modification of that classification to make it comfortable for parents to understand.

The study by N C Santenello *et al.*⁽¹⁷⁾ also involved the caregiver of asthmatic patient in study and validated care givers diary for improvement in asthma control in children. Similar, to this we also prepared a symptom.

The mean age of the children enrolled for this study was 6-10 years as it comprised 53 % of the study population. Similarly, SARP (Severe Asthma Research Program) cohort from Emory University of 77 children with severe asthma and 71 children with non-severe asthma aged 6 to 17 years was studied (18) and Knuffman *et al.*⁽¹⁹⁾ compared the effectiveness of 3 regimens in achieving asthma control in children aged 6 to 14 years with uncontrolled mild-moderate persistent asthma.

In our study males were 16 (53.3 %) and females were 14 (46.7 %). Thus, study demonstrate that males were more prone to asthma than females which goes in accordance with previous studies by Pal *et al.*,⁽²⁰⁾ which showed that prevalence of bronchial asthma was higher among males (8.77%) compared to females (4.33%).

. Our study throw light on sensitivity and specificity of parental grading of asthma severity correctly with regard to doctor diagnosis in various asthma severity classification ranging from 66.6 to 100% and 100% respectively. This finding corroborated with various studies, of partnership with parents and children with goals of therapy in improving disease control were observed (21). Study by Q M van Dellen *et al.*⁽²²⁾ also explains the importance of participation of parents for proper understanding of asthma and adherence to therapy.

We concluded that 25(83.3%) parents graded asthma correctly and 5(16.7%) parents could not grade it correctly. we concluded that the HACD is a specific tool for all grades of asthma to classify them as per GINA 1993 classification. It is also a sensitive tool for assessing all grade of asthma severity, but sensitivity is slightly low (66.6%) for sever persistent grade of asthma but as the number of patients with severe persistent asthma were not high so it cannot be exactly correlated. Further we tried to understand the cause behind those 5 parents who could not grade correctly. As, for grading asthma according to HACD parents should understand the diary, what symptoms are included in diary and how to classify those symptoms as per timing (morning, night) and grading on basis of those symptoms.

Majority of the parents included in study were 26-30 years old and 92.8% of them had graded correctly. Most of children's parent age who graded asthma correctly as per HACD falls between 26-30 years age group followed by 31-35 years. From our study it was concluded that parents of age group 26-35 year have higher rate of grading asthma correctly as per HACD, but we could not get any evidence to support this. Till now we could not get any study related to association of parental age with grading of asthma severity or asthma control.

In our study, most of the parents were mothers (n=24, 80%). The study data revealed that out of 24 females included in study 19 females graded correctly (79%), all male included in study graded it correctly (100%). Similarly, in a study by AlOtaibi and AlAteeq, among the study group, 165 (71.4%) were mothers, and 40 (17.3%) were fathers, with the rest being guardians and relatives (23), finding of study concurred with our study finding. We assume that females can grade asthma severity less accurately compared to males, probably because of poor understanding of HACD mostly attributed to poor education of females. There are some studies in literature to support this where poor knowledge of mother due to lower education among females leads to more asthma complication and poor asthma control.⁽²⁴⁾

In study population parents who were graduate and postgraduate had all graded correctly (100%), parents of higher secondary educational status 90% could grade it correctly. The study concluded that parents who belong to higher educational status had better understanding of symptoms and diary and so could grade asthma correctly and better asthma monitoring. Similar finding was obtained from the study by Amani K. Abu-Shaheen,⁽²⁵⁾ Stromberg Celind *et al.*⁽²⁶⁾ Majority of the parents who graded asthma correctly belong to upper socioeconomic status i.e. upper (100%), lower middle and upper middle class (100%). Similar study by Cope *et al.*⁽²⁷⁾, LS Kopel⁽²⁸⁾ found that children from families in lower income adequacy levels had poorer asthma control.

Overall, we can wind up that HACD is a sensitive and specific tool for parent to grade asthma severity and seek medical advice at appropriate time before exacerbations of asthma develop. Apart from patients age and gender, parents or care givers demographic data also has impact on asthma grading. From our study we conclude that parents of age group between 26-35, male gender had good understanding of symptom diary. We also observed that higher education of parents, parents of upper socioeconomic status graded asthma severity more correctly.

Strength of study: parents can understand symptoms better than children. HACD is a Hindi diary it is easier for parents to understand diary in their local language and grade asthma severity.

LIMITATION OF STUDY

Our study has limitation, since HACD is one month diary for assessing asthma severity, so effect of seasonal variations could not be established. For these reasons, HACD may not be totally reflective of the actual disease status and the actual asthma control. To assess the yearly control of the child, longitudinal studies are necessary. Another limitation is that various triggers for exacerbation of asthma symptoms and spirometry not been studied.

CONCLUSION

1. HACD is a simple, sensitive and specific, easy to understand tool for classifying different Grades of asthma severity.
2. 5 mins training programme taken for teaching parents a method of charting symptom diary.
3. Majority of the parents included in the study are females of age group of 26 -35 years with higher education belongs to Upper middle-class society concluding that these demographic factors affect the incidence of asthma as well as asthma severity and control.
4. This study made the understanding of asthma and its grading assessment simple for parents for classifying severity based on symptoms. This will be helpful for proper management of asthma and decreasing mortality and morbidity due to asthma.

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