ROLE OF HELICOBACTER PYLORI IN BRONCHIAL ASTHMA : A CASE CONTROL STUDY

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Abstract: 30 cases of asthma along with 20 unrelated controls were included in this study after strictly following inclusion and exclusion criteria. Both cases and controls were subjected to clinical examination and battery of investigations, including PFT, upper Gl endoscopy and specific tests for H. pylori. Cases with asthma have significantly high prevalence of H. pylori (73.3%) as compared to controls (60%). Sensitivity and specificity of rapid urease test for H. pylori is more than antral histopathology.(90% v/s 68%). After treatment of H. pylon cases had significant improvement in asthmatic symptomatology in the form of no exacerbation decreased need of medications, decreased night time exacerbation along with decreased in serum IgE levels and significant improvement in GIT symptoms.

INTRODUCTION

Bronchial asthma is a disease characterized by episodic airflow obstruction which is partially reversible; lung inflammation, particularly in the airways and bronchial (airways) hyperresponsiveness[1]. Etiopathogenesis of asthma is still poorly understood and treatment is mainly based on symptoms rather than underlying disease process, so there is always a need to look for new causes which may be associated and/or causing asthma.

As H.pylori is also associated with many extragastric conditions[2] like allergic diseases of skin e.g.urticaria, it may be possible that H.pylori may be linked directly to asthma as asthma is also an allergic disorder of respiratory tract.

We undertook this case control study to know the prevalence and correlation of H.pylori in patients of bronchial asthma.

MATERIAL AND METHODS

30 patients of bronchial asthma who fulfilled at least one of the following criteria[3] (a.) An increase in FEF1 of at least 15% after bronchodilator therapy. (b.) Spontaneous diurnal variability of peak expiratory flow rate (PEFR)/FEV1 of >20%. (c.) Clinical features consistent with diagnosis of asthma. `20 unrelated controls attending the allergy clinic, medical OPD and wards of SMS Medical College and Hospital, Jaipur (Raj.) were included in study and assessed by detailed history, clinical examination and relevant lab investigations.

Inclusion Criteria: 1.) All patients with bronchial asthma who fulfill at least one of the following criteria (a)An increase in FEV1 of at least 15% after bronchodilator therapy; (b) Spontaneous diurnal variability of peak expiratory flow rate; (c) Clinical features consistent with diagnosis of asthma. 2.) Patients willing to undergo upper GIT endoscopy. 3.) Patent between age of 15-65years 4.) Patients who were clinically stable at the time of entry into this study.

Exclusion Criteria (1) Patient not fulfilling diagnostic criteria of asthma. (2) Serious concomitant medical or surgical illness related to lung, liver, kidney or brain., (3) Immunocompromised patient. (4) Pregnancy. (5) Patient who had history of previous esophageal or pulmonary surgery (6.) Patient on antireflux medication.

Subject were studied as: Asthma and GIT characteristic of patients with Asthma GIT Questionnaire upper GIT endoscopy along with gastric antral biopsy for the evidence of H.pylori by means of rapid urease test (helikochek test) and histopathological examinations with special staining for H.pylori. Along with this, spirometry pre and post bronchodilator and other relevant investigations like s.lgE, TEC, CBC, DLC, X-ray chest PA view were done.

Those found positive for H.pylori by either rapid urease test and/ or histopathological examination were given 14 days of standard course of anti H.pylori treatment and later on followed for five month to see improvement in asthmatic and GIT symptomatology by means of history, examination and investigations. In those 14 days patients (only cases) were kept on rescue medications in the form of inhaled bronchodilators e.g. salbutamol on SOS (as and when required) basis.

RESULTS

Out of 30 cases, maximum 9(30%) were in 35-44 yrs. of age group. It shows maximum cases were in middle part of Gaussian distribution. 5(16.6%) cases were in each of 25-34,45-54,55-65 yrs. of age group. 6(20%) cases were in 15- 24 yrs. of age group. In control group they were distributed almost equally among all age groups. Mean age of cases was 38.03 yrs. and 35.86 yrs. of controls.

Out of 30 cases, 13(43.3%) had both, rapid urease test as well as antral biopsy histopathology, positive, while 8(26.6%) had both negative. 2(6.6%) had only antral biopsy histopathology positive and 7(23.3%) had only rapid urease test positive (Table 1).

Table 1.: *Combined rapid urease test and antral biopsy Histopathology results in cases*

Both Histopathology & Rapid Urease Test Positive		Both Histopathology & Rapid Urease Test Negative		Histopathology Positive But Rapid Urease Test Negative		Histopathology Negative But Rapid Urease Test Positive	
No.	%	No.	%	No.	%	No.	%
13	43.3	8	26.6	2	6.6	7	23.3

Out of 20 controls, 6(30%) had both, rapid urease test as well as antral biopsy histopathology, positive, while 8(40%) had both negative. 2(10%) had only antral biopsy histopathology positive and 4(20%) had only rapid urease test positive(Table 2).

Table2: *Combined rapid urease test and antral biopsy Histopathology Results in Controls*

Both Histopathology & Rapid Urease Test Positive		Both Histopathology & Rapid Urease Test Negative		Histopathology Positive But Rapid Urease Test Negative		Histopathology Negative But Rapid Urease Test Positive	
No.	%	No.	%	No.	%	No.	%
6	30	8	40	2	10	4	20

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Table3: *Response to anti H. Pylori treatment in cases*

Asthma symptomatology				GIT symptomatology			
Improved			Not improved	Improved			Not improved
No Exacerbation	↓ Exacerbation	↓ Need of rescue medications		Epigastric pain	Heart burn	Post prandial fullness	
5 (25%)	11 (55%)	13 (65%)	4 (20%)	10/11 (91%)	7/7 (100%)	9/9 (100%)	1 (9.8%)

Out of 20 cases who came for follow up 5(25% had no exacerbation of asthma while 11(55%) had decreased exacerbation and 13(65%) had decreased need of rescue medications. Likewise in GIT symptoms epigastric pain relieved in 10(91%) while heart brun decreased in 7(100%) cases. There was no response in asthma symptomatology in 4(20%) cases and in GIT symptomatology in 1(9.9%) case.

Out of 20 controls, 12 were positive for H.pylori (rapid urease test/ histopathology/both).They were treated with 14 days of standard course of anti H.pylori treatment. On follow-up 11 controls had significant improvement in their GIT symptoms.

In study group: upper GI endoscopy examination in asthmatic cases, it showed that 15(50%) had normal study while 13(43.3%) had antral gastritis. GERD was present only in 1 patient in this group.

In control group; In this group 13(65%) had upper GI endoscopy normal while just 4(20%) had antral gastritis (Table 4).

Table4: *Upper GI endoscopy findings in cases and control*

FINDINGS	CASES		CONTROLS	
	Numbers	Percentage	Numbers	Percentage
Normal Study	15	50	13	65
Antral gastritis	13	43.3	4	20
Esophagitis/GERD	1	3.3	-	-
Peptic ulceration	1	3.3	1	5
Others Duodenitis & Hiatus hernia	-	-	2	10
Total	30	100	20	100

DISCUSSION

This study was done to find out the incidence of H. Pylon in patients with asthma and tried to delineate any causal relationship between them so that this may lead to new dimensions in diagnostic approach of asthma and may help in developing new therapeutic interventions that may enable us to prevent the development of disease and associated irreversible changes in airway functions.[4]

lgE levels in cases ranged from 75 lU/mi to 20001U/ml.(mean 655 lU/ mi) while controls ranged from 68 lU/mi to 20001U/ml (mean 386 lU/ mi) IgE is the hallmark of atopic diseases, such as asthma, allergic rhinitis and atopic dermatitis. —treatment of H. pylon, serum IgE level decreased significantly. (p value<O.05).

When combined rapid urease test and antral histopathology were assessed cases out of 30 cases, 22(73.3%) cases were positive by both or either modality, 15(68.18%) had positive histopathology; while 20(90%) had When both tests were combined, we had 6 (30%) controls positive for H. pylon by both modalities of tests, 8 (40%) were negative in both while 2 (10%) had positive histopathology but negative rapid urease test and 4 (20%) had negative histopathology but positive rapid urease test.

In our study, out of 30 cases total 22(73.3%) were positive for H. pylon while out of 20 controls, total 12(60%) were positive for H. pylon (p value< 0.05) similarly Karel'skaia et a16 also found H. pylon invasion in 89.2% patients with chronic allergic diseases (asthma, urticaria) but study of Nijevitch et a17 had only 52.4% H. pylon invasion detected histologically in children with chronic asthma. However Tsang et al8 did a study to know the seroprevalence of H. pylon in asthma. They found that H. pylon seroprevalence was not significantly different between asthmatic and control subjects. (p value>0.05)cases, were given 14 days of standard anti H. pylon treatment, meanwhile continuing rescue medications for asthma. After 14 days of treatment 20 patients turned up for follow up. Out of these 20, 9 patients refused to undergo endoscopy again due to some or other reason and as in our institution we have no facility of noninvasive tests like urea breath test, we have to rely on patients' history and symptomatology.On follow up, out of 20 cases, 5(25%) had almost complete relief from asthmatic symptoms. They had almost nil exacerbation and their post bronchodilator response was markedly improved. 11(55%) cases showed significant improvement in the form of decreased nocturnal episodes of shortness of breath. Their post bronchodilator response was improved and they had decreased requirement of bronchodilator therapy. Rest 4(20%) cases showed no improvement. So after giving 14 days of standard anti H. pylon treatment, 16(80%) had improvement in symptomatology of asthma irrespective of bronchodilator treatment (rescue therapy) which is clinically significant (p value<0.05) Out of 20, 11 had epigastric pain before treatment, which was relieved in 10 (90.1%) cases while heart burn and post prandial fullness was relieved in all the patients, clearly suggesting that H. pylon was responsible for these GIT symptoms. Cases who had improvement in GIT symptoms also had significant improvement in asthmatic symptoms.

CONCLUSION

Apart from an increased incidence of H. pylon in patients of bronchial asthma, further proof of role of H. pylon in bronchial asthma came from the fact that with the eradication of H. pylon, asthmatic symptomatology improved in t80%) of the patients. Thus it is believe that though it is a small study, our finding may have important implications in clinical practice and these results may form the basis of future screening program and preventive strategy in bronchial asthma.

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