Efficacy of paracetamol in symptomatic relief of upper respiratory tract infection in children aged between 2 to 5 years

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ABSTRACT

Objective: To determine the efficacy of Paracetamol in symptomatic relief of Upper respiratory tract infection in children aged 2 to 5 years

Study Design: A cross sectional descriptive study

Place and Duration: In Paediatrics Department of Shifa International Hospital Islamabad over a period of 06 months from 1st July 2018 to 31st Dec 2018.

Methodology: Total 150 patients were enrolled and divided into three groups according to age. Patients were given paracetamol per oral with dose of 10 mg/kg/dose at 6 hour interval for 3 days and effectiveness of paracetamol was assessed after 3 days regarding symptomatic relief in upper respiratory tract infection either by doing follow up in OPD or by phone call.

Results: Out of 150 patients 75.33% got relieved of fever along with one or more than one symptoms of URTI after receiving paracetamol for 3 days. No response was seen in 24.67 % of patients. There was no gender specific response to paracetamol (p value 0.935), but efficacy of paracetamol was age specific (p value 0.000) with maximum response in age group 2to 3years.

Conclusion: Majority of patients become afebrile and got relieved of one or more symptoms of upper respiratory tract infection like runny nose, sore throat and cough with paracetamol. Effect was significantly high in age group 2 to 3 years.

Keywords: Paediatrics, Upper respiratory tract infections, Fever, Paracetamol, Efficacy, Symptomatic relief.

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INTRODUCTION

Upper respiratory tract infections (URTI) are the commonest presenting illness in children and a major reason of absentees from school[1,2]. An average 6 to 8 episode of URTI per year are observed in children[3,4]. It mostly occurs in winter and spring but can present throughout a year[2]. Mainly happens in day care, among family and classmates[2,3].

Common cold, tonsillitis pharyngitis, and sinusitis are the main upper respiratory tracts infections[3]. Super added bacterial infections can complicate them and may lead to sinusitis, middle ear effusions and middle ear effusions[3]. Most of upper respiratory tract infections are viral in origin (80%)[4], self-limiting in nature and spread by droplets or by direct contact[3].

Fever is commonest presenting symptom of URTI[5,6]. It is main reason for seeking medical advice as it causes discomfort to a child by causing sleep disturbance, lethargy, decrease appetite, agitation, mood swings, and irritability[7,8] and is a major reason for parental anxiety[7].

Majority of URTI just need a supportive therapy to get symptomatic relief till its natural course and to combat parent's anxiousness. There is no role of antibiotics in uncomplicated URTI proved in multiple studies in Iran[9], Greece[10], Cyprus[11] and London[12]. Study in London[12] also suggested no role of antibiotics in preventing any complications associated with URTI like otitis media, brain abscess and mastoiditis etc[12].

In 2008 study in Italy[7]proved role of antipyretics not only in getting relieved from fever but also in reducing other symptoms of URTI .Among many antipyretics used in study the one found to be effective was Paracetamol[7]. A study in india in 2001 also proved paracetamol efficacy significantly higher in relieving

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fever than placebo[8]. A study in Turkey compared efficacy of efficacy and safety of nimesulide, ibuprofen and paracetmol in URTI. This study revealed better effect of paracetamol in relieving cough symptoms than other two drugs. Recently no such studies have been done.

The rationale of our study was to determine paracetamol efficacy in symptomatic relief of URTI as limited regional and local data is available regarding role of antipyretics in URTI. This study was also done to provide data to avoid unnecessary use of antibiotics in viral self-limiting URTI. We conducted this study to determine the efficacy of Paracetamol in symptomatic relief of Upper respiratory tract infections in children aged 2-5 years.

METHODOLOGY

This cross sectional descriptive study was done at Shifa International Hospital Islamabad in outpatient department of Paediatrics over a period of 06 months from 1st July 2018 to 31st December 2018.Sample size was calculated by using WHO calculator with 0.49 anticipated population proportions and confidence interval of 95. Total 150 patient were enrolled by consecutive Non probability sampling 2 to 5years of age presenting with symptoms of URTI i.e fever, cough, runny nose ,blocked nose, ear ache , and/or sore throat for more than 2 days duration .Patients who were taking antibiotics, those with respiratory rate more than 30 per min and oxygen saturation less than 93%on presentation were excluded from study .Patient were categorized in three groups according to age Group 1: 24-36 months , Group 2: 37-48months Group 3: 49-60months. Patients presenting to pediatric OPD were assessed by complete history and examination after taking verbal consent from parents on predesigned proforma .Data including age, gender, contact number, presenting symptoms including fever > 38 ^{o}C (100.4o), sore throat ,runny nose, blocked nose, cough and earache along with duration of illness were noted. Parents were counseled about etiology and pathogenesis of the disease before starting treatment. Parents were also convinced regarding self-limiting nature of illness and no antibiotics need in URTI.

Patients were advised Paracetamol with dose of 10mg per kg at 6 hours interval for 3 days on OPD basis. Parents were thoroughly counseled regarding danger signs for seeking medical advice on urgent basis. Patient were followed on day 3 to assess the efficacy of paracetamol in relieving URTI symptoms either by phone call or in OPD.

Data Analysis: SPSS version 20 was used .Quantitative data like age was assessed by Mean and SD , qualitative data like gender, signs and symptoms ,efficacy were assessed by percentages and frequencies ,P value of less than 0.05 was taken significant .

Operational definition:

URTI: Patient with fever of more than 38 ^{0}C (100.4 F) of > 2 days duration accompany by blocked or runny nose in presence of atleast one or more symptoms i.e ear ache, cough and sore throat.

Efficacy: Symptomatic relief in URTI after taking 3 days of Paracetamol

Symptomatic Relief: Relief of fever with relief of any other one or more symptoms of URTI.

RESULTS

Out of 150 patients 64 (42.67%) were females and 86 (57.33 %) were males .Age varies from 2 to 5 years with mean age of 1.71 and standard deviation of 0.797 .

Patients were categorized in three groups based on age .75(50%) patients were in group 1 comprises of 42(28 %) males and 33(22 %) females. Group 2 had 23(15.3%) males and20(13.3%) females out of 43(28.7%) patients . In Group 3, 21 (14%) were males, 11(7.3%) were females out of 32(21.3%).

Total 113 (75.33%) patients out of 150 became afebrile and got relieved of one or more than one symptoms of URTI after taking 03 days of oral paracetamol. (24.67 %) patients did not show any response (Table-I)

Table-I: Frequency and percentage of the symptoms presented and symptoms relieved (N=150)

Symptoms	Symptom Presented %	Symptom Relieved %
Fever	150 (100%)	113 (75.3%)
Blocked Nose	37 (24.7%)	13 (35.1%)
Runny Nose	113 (75.3%)	61 (54%)
Cough	119 (79.3%)	58 (48.7%)
Sore throat	95 (63.3%)	70 (73.7%)

Out of 150 patients 37(24.7%) patients presented with blocked nose and 13(8.7%) got relief of blocked nose by paracetamol .Runny nose was a presentation in 113(75.3%) patients and 61(40.7%) showed marked improved by paracetamol after 03 days of treatment

Cough was a presenting symptom in 119(79.3%) patients and 58(38.7%) showed response after getting paracetamol. sore throat was main complaint in 95(63.3%) of patients and relief was shown in 70 (46.7%)patients.44(29.3%) patients had earache and 14 (9.3%) got improved after paracetamol intake

Major effect of paracetamol was seen in relief of fever followed by sore throat, runny nose and cough respectively.

Out of 86 (57.3%) male patients 65(43.3%) became afebrile and of 64 (42.7%) female patients 48(32%) showed response. P value of .935 proved no significant difference in response of paracetmol based on gender.

In the age groups, POST stratification chi square test was applied, Pearson chi-square value was found to be 28.702 with degree of freedom 2 and p value of .000, which is significant showing that efficacy, is dependent upon age. In the age groups, Group 1 included 75(50%) patients, and efficacy was seen in 67(59.3%) patients. Group 2 included 43(28.7%) patients, and efficacy was seen in 33(29.2%) patients .Group 3 included 32(21.3%) patients, and efficacy was seen in 13(11.5%) patients (Table-II). Post stratification chi square test was applied, Pearson chi-square value was found to be 28.702 with df 2 and p value of .000, which is significant. It means that efficacy is dependent upon age. In group 1 majority of URTI were found to be self-

limiting and efficacy was significantly higher as compare to group 2 and 3.

Table-II: Efficacy of Paracetamol according to Age

	Efficacy		Total
	Yes (n=113)	No (n=37)	n=150
Group 1 24-36 months	67 (59.3%)	8 (21.6%)	75 (50.0%)
Group 2 37-48 months	33 (29.2%)	10 (27.0%)	43 (28.7%)
Group 3 49-60 months	13 (11.5%)	19 (51.4%)	32 (21.3%)

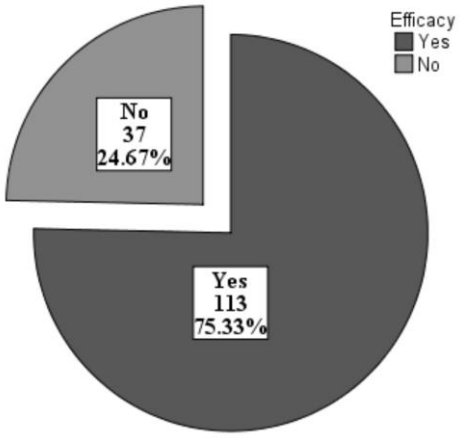

Fig-1: Pie chart showing overall efficacy of Paracetamol after 3 days of treatment.

DISCUSSION

Upper respiratory tract infections are major junk of diseases presenting to pediatrician. Recurrent URTI is a common problem in aged 2 to 6 years mostly viral in origin[13]. Fever is common presenting symptom in all URTI and is a major concern of parents[7]. Different medications are being used to treat different symptoms of URTI including antipyretics (paracetamol), antihistamines, cough suppressants such as dextromethorphan, anti-inflammatory agents (ibuprofen), phenylpropanolamine, and decongestants such as pseudoephedrine. They showed some relief of symptoms but did not provide evidence for shorten the duration of illness in children[14].

Randomised controlled trial"s quantitative systematic review by Fahey et al compared antibiotics to placebo for URTIs in children sorted that antibiotic treatment could not reduce complication rates or alter clinical outcome in URTI[15].

Respiratory tract infections are the 2nd common indication for prescribing antibiotic in primary care i.e almost 10% of all prescriptions per year .National Centre for Health Statistics data from United States indicated that about 75% of all outpatient prescriptions were for antibiotics for un- complicated URTI.

Non judicial and frequent use of antibiotics in children is a main reason for overwhelming antibiotic resistance and it is a major health problem as mostly infections in children like upper respiratory tract infections and GI infections are caused by viruses and self-limiting in nature .Antibiotics are prescribed unnecessary for these virus induced infections[16]. Almost 90% of URTI are viral and self-limiting in nature. Clinical research by Mungrue et al have proved no and minimal role of antibiotics in common URTI like nasopharyngitis, otitis media and sore throat[16]. A study in Oman in 2011 suggested either no prescription or delayed prescription of antibiotics in cases of UTI in children[17]. Researches have been done to reveal the role of antipyretics in symptomatic relief of upper respiratory tract infections and to prove their analgesic and anti-inflammatory effects of these antipyretics when used as over the counter medicine[7].

Study in India done to see the response of paracetamol in children with uncomplicated URTI in age group from 6 months to 6 years[8]. The variables used in the study were rate of fall of temperature, fever clearance time , percentage reduction of temperature, symptomatic improvement (based on categorical improvement in alertness activity, comfort, mood, fluid intake and, appetite), proportion of afebrile children after1,2, 4 and 6 hours of dose, and adverse effects of drug like raised liver enzymes .Study concluded that paracetamol proved to be quite effective antipyretic in getting symptomatic relief in febrile illness in children without side effects ,but did not show paracetamol efficacy in getting relief from other symptoms of URTI like cough ,blocked nose, runny nose, ear ache and sore throat as shown in our study . No such study had been done in Pakistan or locally which has shown efficacy of paracetamol in relieving common symptoms of URTI so we conducted this study to conclude the effectiveness of paracetamol in relieving major symptoms of URTI.

CONCLUSION

Majority of patients become afebrile and got relieved of one or more symptoms of upper respiratory tract infection like runny nose, sore throat and cough with paracetamol. Effect was significantly high in age group 2 to 3 years.

RECOMMENDATIONS

Paracetamol could prove to be most effective, economical and feasible drug to be prescribed in children presenting with symptoms of Viral URTI .so that unnecessary use of antibiotics and their side effects could be lessened.

CONTRIBUTION OF AUTHORS

Yaqub A: Conceived idea, Design research methodology, Literature search, Data collection, Manuscript writing.
Imran H: Literature search, Data collection, Statistical analysis, Manuscript writing
Ghani Z: Literature search, Critical manuscript revision
Hussain M: Concieved idea, Data collection
Ikram K: Literature search, Statistical analysis

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