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Original Research Article

Effect of honey and ginger mixture on productive cough in pediatrics patients

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ABSTRACT

Background: Cough is common problem in pediatric age. Most of the parents use over the counter drugs along with cough syrups. Most of the cough syrup causes drowsiness and sedation as an adverse effect. So considering this we use ginger and honey mixture for treatment of productive cough to see its effectiveness. In Ayurveda, it is used since ancient time and in Indian it is used for home remedy for treatment of cough.
Methods: We selected patient attended pediatric outpatient department (OPD) complaining of productive cough. We selected 90 patients and divided in to three groups 30 patient in each group. Group I we gave antibiotics, antihistaminic with syrup ascoril (ambroxol 30 mg/5 ml and levosalbutamol 1 mg/5 ml and guaifenesin 50 mg/5 ml). Group II antibiotics, antihistaminic with honey and ginger mixture. In group III we gave antibiotic with antihistaminic along with both honey and ginger mixture with syrup ascoril. After this complete follow up to 10 days on mobile performed. We observed for occurrence of any deterioration of condition with occurrence adverse effect and how many days were required for improvement of patient condition.
Results: We got very promising results were we saw improvement in symptom in 6 day with honey and ginger group as compared to cough syrup group were p value is significant and highly significant (<0.005 and 0.001 respectively) with minimal acceptable adverse effect.
Conclusions: So from our study we can conclude the honey and ginger mixture is promising treatment of productive cough with less side effects.

Keywords: Productive cough, Honey, Ginger

INTRODUCTION

A cough is a sudden and often repetitively occurring process which helps to clear the large breathing passages from secretions, irritants, foreign particles and microorganisms. When there is a blockage or irritation in the throat or upper air passage, the brain thinks a foreign element is present and tells the body to cough to remove that element. Generally coughing is perfectly normal. A cough can help to keep your throat clear from phlegm and other irritants. However, sustained coughing can also be symptomatic of a number of conditions. The cough reflex consists of three phases: an inhalation, a forced exhalation against a closed glottis, and a violent release of air from the lungs following opening of the glottis, usually accompanied by a distinctive sound. Coughing is either voluntary or involuntary.[1]

The treatment of cough in children is based on an underlying cause. In children half of cases go away without treatment in 10 days and 90% in 25 days. A trial of antibiotics or inhaled corticosteroids may be tried in

children with a chronic cough in an attempt to treat protracted bacterial bronchitis or asthma.[2] A cough is the most common reason for visiting a primary care physician in the India. The important herbal drugs used as a cough remedy are described in the below sections.

Ginger (*Z. officinale*) is one of the most popular natural cures for a cough. Crushed fresh ginger is boiled with water. This herbal solution is drunk three to four times a day for relief from sore throat, non-stop coughing and even congestion. Some lemon juice and honey may be added to it. Another option is to chew fresh raw ginger on and off throughout the day to reduce cough. Ginger in combination with tulsi (*Ocimum sanctum*) is also an effective remedy for cough. Crush about 10 leaves of tulsi, mix with juice extracted from a small ginger piece, add in an equal quantity of honey and mix; swallow about a single teaspoon of this mixture thrice a day to get relief from cough. For a dry cough, one of the easiest ways of finding relief is to cut a piece of fresh ginger, sprinkle some salt on it and chew it for a few minutes. However, not everyone likes the strongly aromatic taste of ginger and in such cases, a tea made with ginger is equally good. The pounded ginger into fine pieces is boiled with one cup of water till the volume reduces to half the original quantity. The liquid is strained, one teaspoon of honey added and drunk when warm to give a soothing effect against cough.[3]

Honey is a time-honored remedy for a sore throat. It can alleviate coughs more effectively than over the-counter medicines that contain dextromethorphan, a cough suppressant. Drinking tea or warm lemon water mixed with honey is beneficial to soothe the sore throat. But honey may be an effective cough remedy, too. Since honey is low-cost and widely available, it might be worth a try. Hot milk with honey can relieve a dry cough and reduce chest pain experienced from continuous coughing. For best results, it is drunk before going to sleep.

For added benefits from the analgesic properties of honey, a teaspoon of plain honey is swallowed on empty stomach. This will help to clear the mucus and to soothe the throat. These home remedies can give relief from the various symptoms of a cough. As drugs use for cough causes the sedation is the main problem, so alternative drug therapy is main stay for treatment of cough in paediatric age group.

So we consider the present study. As the ginger and honey is routinely use in Indian families as home remedy for the treatment of pardiatric cough and cold.

The objective of this present study is to compare the effects of honey and ginger mixture with the syrup ascoril (ambroxol 30 mg/5 ml and levosalbutamol 1 mg/5 ml and guaifenesin 50 mg/5 ml) with amoxicilline, and clavulanic acid (15 mg/kg two times a day) treatment for productive cough. In this study we saw the how many days required for complete recovery along with adverse effects caused by both the therapies.

METHODS

This was a prospective open label randomized study. Conducted in Mahatma Gandhi Mission (MGM) Hospital and Medical College, Aurangabad. In department of pharmacology with pediatrics from January 2017 to March 2017. The study was approved by institutional ethics committee, MGM Medical College, Aurangabad.

Patient attended pediatric outpatient department (OPD) from January 2017 to March 2017 were included in this study. Patients were those between the ages of 1 to 17 years complaining of productive cough with upper respiratory tract infection. Productive cough and rhinorrhea of seven days duration with or without nasal congestion and fever, sore throat, myalgia, and headache. While we excluded if patients were had dry cough, signs or symptoms of asthma, pneumonia, laryngotracheobronchitis, sinusitis, and/or allergic rhinitis, along with it we also excluded the patients already receiving any cough or cold medication.

After getting informed consent from parents, all participating parents of children were to give the drugs as per the protocol. Total 92 patients were enrolled in the study and they were divided into three groups as follows.

Study design

This is open label study. The patients included in this study were divided in to 3 treatment groups as given below.

Group I

It included patients who were given: syrup/tablet amoxicillin and clavulanic acid (15 mg/kg twice daily) (tablet clavam) and tablet montelukast and levocetirizine (4/1.25 mg OD up to 5 years age and 5-10/2.5-5 mg OD above 5 years age) with or without syrup/tablet paracetamol (15 mg/kg SOS); and syrup ascoril (ambroxol 30 mg/5 ml and levosalbutamol 1 mg/5 ml and guaifenesin 50 mg/5 ml).

Group II

It included patients who were given: tablet montelukast and levocetirizine (4/1.25 mg OD up to 5 years age and 5-10/2.5-5 mg OD above 5 years age with or without syrup/tablet paracetamol (15 mg/kg SOS); syrup ascoril (ambroxol 30 mg/5 ml and levosalbutamol 1 mg /5 ml and guaifenesin 50 mg/5 ml); and honey 2.5-5 ml (6 month to 5 years- above 5 years) along with 0.5-1 ml of ginger juice(6 month to 5 years-above 5 years).

Group III

It included patients who were given: syrup/tablet amoxicillin and clavulanic acid (15 mg/kg twice daily) (tablet clavam) twice daily and syrup ascoril (ambroxol 30 mg/5 ml and levosalbutamol 1 mg/5 ml and guaifensen 50

mg/5 ml) four times a day and tablet montelukast and levocetirizine (4/1.25 mg OD up to 5 years age and 5-10/2.5-5 mg OD above 5 years age with or without syrup/tablet paracetamol (15 mg/kg SOS) and honey 2.5-5 ml (6 month to 5 years-above 5 years) along with 1 ml of ginger juice (6 month to 5 ml of ginger juice (6 month to 5 years-above 5 years).

Honey and ginger mixture preparation

We advise parents of patient to buy honey from market (Dabur honey) and ginger purchased from local market. We advise parents mix honey 2.5-5 ml (6 month to 5 years-above 5 years) along with 1ml of ginger juice. Ginger juice was prepared by grinding it. This mixture given to children 4 times a day.

We include total 92 patients after obtaining the informed consent from parents and, this study was OPD base, we interviewed the parents after attaining the OPD till 10 days daily and asked the above question verbally on mobile phone. Out of 92 patient 2 were drop out due to mobile phone problem.

No physical examination was performed on second day of study unless there was illness progression.

We design a questionnaire to see the improvement and to monitor the adverse effect (ADR). Following question were included in the questionnaire to assess the effect of drugs: how much improvement in symptoms, what is the severity of cough as compare to before medication, any unwanted effect occur during taking medication, any hangover effect experience, any sedation experience, vomiting, and drowsiness.

Cough severity and adverse effect assessment questionnaire included the following.

Outcome measures

The outcome was how much improvement. It is measure by the improvement in symptoms along with the occurrence of adverse effects.

Statistical analysis

Statistical analysis performed by using statistical comparisons of variables between treatment groups. We used an unpaired student "t "test was used and p value less than 0.05 was considered statistically significant. All statistical analyses were done by using the statistical package for the social sciences (SPSS) software.

RESULTS

92 children enrolled in the study out of this 90 completed the study. Two excluded from study due to diversion of treatment or their mobile was switch off (Table 1). After the treatment of all cough related aspect was significantly decreased (Table 2). Time required for the relief of symptoms is significant in all group p value is highly significant in group III. Recovery time required for group I is around 8 to 9 days, while in group II it was 5-6 days where p value is <0.005 and in group III recovery period is only 4-5 days only, as compare to group I is highly significant p<0.001. Along with it we also monitored adverse effects of drugs. In our study most of the adverse effects (hangover, sedation, vomiting, and drowsiness). In the group I seven patients suffer from sedation while one patient from vomiting. In group II one patient suffer from hangover and five patients from sedation and in group III eight patients suffers from sedation while one from drowsiness (Table 3).

No one participants were deteriorated during study.

Table 1: Age wise distribution of patients.

Age group (years)	No. of patients	Percentage of patients (%)
6 months-5	23	25.5
6-10	20	22.2
11-15	34	37.7
16-17	13	14.4

Table 2: Time required for recovery.

Treatment groups	Average days required to patient for recovery
Group I	8.2±1.2
Group II	5.4±1.5*
Group III	4.8±0.5**

*P value <0.05, **p value <0.001

Table 3: Comparison of adverse effect after intervention.

Item	Treatment groups		
	G1	G2	G3
Hangover	0	1	0
Sedation	7	5	8
Vomiting	1	0	0
Drowsiness	0	0	1

DISCUSSION

Cough is one of the common symptoms in pediatric patients. For which patients seek attention from primary care physician to pediatricians and pulmonologist. Cough mostly treated by antibiotics.[4]

Many previous studies shown drugs use for cough do not relieve the nighttime symptoms of URTIs.[5] Along with this most of the OTC drugs for cough produces side effects like somnolence, restlessness, overdoses, and unexpected deaths.[6-11] With this data consideration cough and cold treatment with honey and ginger. In Ayurveda use of honey and ginger recommend for the treatment of cough and URTI.[12,13]

Honey and ginger mixture is used in India as a home remedy for treatment of dry cough as well as productive cough, few scientific studies are also present for honey and ginger use in cough.[14,15]

Honey is a sweet, viscous liquid with a complex chemical composition along with 25 carbohydrates, free amino acids, vitamins, trace elements and flavonoids.[16-18] Honey is also a powerful antioxidant.[19] Honey is also had antibacterial, antiviral and anti-inflammatory properties.[20] Gram-negative and gram-positive bacteria found in the upper respiratory tract such as *Staphylococcus aureus* (*S. aureus*), *Streptococcus faecalis* (*S. faecalis*), *Candida albicans* (*C. albicans*), *Klebsiella pneumoniae* (*K. pneumoniae*), *Pseudomonas aeruginosa* (*P. aeruginosa*), *Escherichia coli* (*E. coli*), *Salmonella spp.* and *Shigella dysenteriae* (*S. dysenteriae*) also suppressed by honey.[21] Hence honey used for cough treatment in traditional medicine.[21]

Ginger is popular natural cures for a cough. Ginger also has the antimicrobial property like honey. Ginger is carminative, pungent. Ginger has antimicrobial activity against *Proteus mirabilis*, *Klebsiella pneumoniae*, and *Streptococcus aureus* along with it also has antioxidant property.[22] Raja et al successfully demonstrate the anticough forming activity of ginger extract as compared to standard (benadryl).[22] Raja et al also showed that ginger extract has no adverse effect were as in benadryl treated group shows changes in liver patholiogy.[22]

In our study we saw only time required for relief of productive cough and compare in the group. We divided the patient in three group. In first group time required 8-9 days for recovery. In group II 5-6 days was required for recovery. Group III time for required was 4-5 days. From this we conformed that honey and ginger mixture is help to reduce the recovery days in group II and III. Recovery time for III was less than II due to antibiotics (amoxicillin) along with honey and ginger mixture. Effect is due to the antimicrobial and anticough activity of honey and ginger mixture.[21,22]

When we saw the adverse effect in each group. Seven persons suffered from sedation one from vomiting in group I. While in group II one patient suffers from hangover and five from sedation. Group III eight patient suffers from sedation and one from drowsiness. Sedation was more common in all the groups along with drowsiness and hangover, it may be use of levocetrizine while vomiting may be because of strong cough reflex.[23]

In our study group III required less time for recovery as compared to group I where p value is highly significant. Less time required because addition antibacterial effect of honey and ginger, as explained above. Group II we use only honey and ginger mixture no antibiotics were use. And again, in group recovery time was also less, from this we can conclude that honey and ginger extract the extract has antimicrobial property.[22]

Limitation

Major limitation of our study is limited sample size and short duration of study. If we conduct it for large sample size and for long period, more data will be collected as safety and rare adverse effect.

CONCLUSION

From this study we can conclude that honey and ginger extract has anticough and antimicrobial activity. This can use in treatment of productive as well as dry cough with no adverse effects.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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