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TO ASSESS THE EFFECTIVENESS OF VITAMIN C SUPPLEMENTATION IN PREVENTING THE INCIDENCE OF PNEUMONIA IN ICU PATIENTS

Medicine

KEYWORDS: Vitamin C, Pneumonia, ICU patients

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ABSTRACT

BACKGROUND In our country there are many studies regarding the role of vitamin C and scurvy but very less studies are performed in correlation of vitamin C and pneumonia. A**IM AND OBJECTIVES** To study efficacy of vitamin C supplementation in preventing hospital acquired pneumonia. **APPLICATION OF RESEARCH** This study will help us understand whether vitamin C can be used as a prophylactic therapy for controlling nosocomial pneumonia in hospitalized patients. Pneumonia is a fairly common severe infection and vitamin C is a safe and inexpensive essential nutrient. The possibility that vitamin C supplementation in ICU patients may have a prophylactic effect is worth studying. **MATERIALS AND METHODS** A total number of 100 patients randomly selected over a period of 2 months by ruling out pneumonia on chest X ray were studied in medicine ICU of Krishna Institute of Medical Sciences Karad, and supplemented with 500mg of vitamin C four times a day for 1 week and results were observed **RESULTS** The incidence of pneumonia increases with age. Out of 100 patients in the study, 34% are in the age group of 41-60 years, 30% are in the age group more than 60 years, 26% are in the age group of 21-40, and 10% are in the age group 18-20 years. Out of 100 patients 43% were males and 57% were females. After administration of tab vitamin C 500mgs four times a day for 7 days , out of 100 patients 18% of patients developed evidence of pneumonia on chest X ray in ICU care and 82% of patients did not had pneumonia. **CONCLUSION** This study recommends, Vitamin C could be used as an inexpensive preventive measure for preventing nosocomial pneumonia in hospitalized patients . Its therapeutic use can be part of regular hospital treatments as its cost & risks are low.

INTRODUCTION

Pneumonia is a term that usually denotes inflammation of the lung parenchyma due to infectious agents.

According to American Thoracic Society (ATS) guidelines, nosocomial pneumonia or Hospital acquired pneumonia is defined as pneumonia occurring 48 hours or more after admission and which was not incubating at the time of admission.[1] Ventilator associated pneumonia is defined as in a person who has a device to assist respiration through an endotracheal tube or tracheostomy tube for a period of atleast 48 hours before the onset of infection.[2] Nosocomial pneumonia is the second most common nosocomial infection and is more prevelant in medical and surgical intensive care units (ICUs). It is responsible for 25% of signs of infection in ICUs and accounts for 50% of all antibiotics administered in the hospital. Starting in the 1930s, some German and US physicians proposed that vitamin C would be beneficial in the treatment of pneumonia.[3] Vitamin C plays a major role in immune system as a physiological antioxidant by protecting host cells against oxidative stress caused by infections. Its concentration in phagocytes and lymphocytes is very high compared with the level in plasma, indicating a major role of vitamin C in immune system. In various experimental settings, vitamin C increased the functioning of phagocytes, the profileration of T-lymphocytes and the production of interferon and decreased the replication of viruses. [4] Moreover, many infections, including pneumonia, lead to reduced vitamin C levels in plasma, leucocytes and urine. Because of these changes in metabolism, vitamin C might have a therapeutic effect on pneumonia patients. Thus there is a biological rationale to examine the effect of vitamin C on infections in humans. We carried out a systematic review, published in the Cochrane Library, in which we examined the role of vitamin C supplementation on preventing and treating pneumonia.[3] We identified three controlled trials reporting on the preventive effect and two on the therapeutic effect of vitamin C against pneumonia.[5-9] Heavy physical stress causes oxidative stress, and a recent study found that vitamin C administration prevented exercise induced oxidative changes.[10]

AIM AND OBJECTIVE

To study efficacy of vitamin C supplementation in preventing hospital acquired pneumonia.

APPLICATION OF RESEARCH

This study will help us understand whether vitamin C can be used as a prophylactic therapy for controlling nosocomial pneumonia in hospitalized patients. Pneumonia is a fairly common severe infection and vitamin C is a safe and inexpensive essential nutrient.[3] The possibility that vitamin C supplementation in ICU patients may have a prophylactic effect is worth studying.

MATERIALS AND METHODS

It is interventional prospective study enrolling 100 patients from ICU unit admitted in Krishna Institute of Medical Sciences, Karad for period of 2 months. The patients selected according to the inclusion criteria of the research and after taking written and informed consent of the patient or the relative, patient will be subjected to chest X ray to rule out pneumonia on admission and these patients will be given vitamin C tablet at a dose of 500mg four times a day for one week. Proforma will be filled to keep a record of the patient and treatment. Chest X ray will be repeated after 7 days to rule out presence of pneumonia.

INCLUSION CRITERIA

1.Patients more than >18yrs of age
2. Patients on mechanical ventilation.
3. Patients with COPD, bronchial asthma, anemia, diabetes, hypertension, sepsis.
4. Patients on enteral nutrition and TPN.

EXCLUSION CRITERIA

1. Patients with head injury, renal failure, cardiac patients, stroke, MI, ACS, pericardial effusion and cancer.

2. Patients with immunocompromised condition : HIV, pulmonary TB, complicated malaria and dengue

3. Patients with contraindications to vitamin C treatment : hemochromatosis, oxalic lithiasis antecedent, G6PD treatment be desferioxamine and warfarin therapy.

4. Patients already diagnosed with pneumonia.

5. Pregnant and lactating women.

RESULTS

TABLE 1: DISTRIBUTION OF SUBJECTS ACCORDING TO AGE GROUPS (N=100)

AGE GROUPS	NO. OF SUBJECTS
18-20	10
21-40	26
41-60	34
>60	30

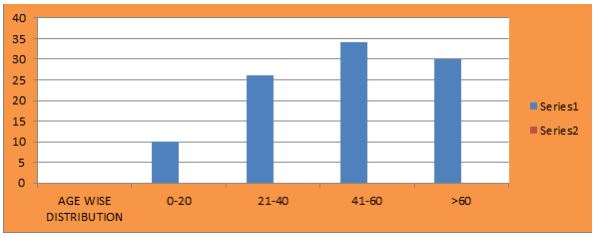


TABLE 2: DISTRIBUTION OF SUBJECTS ACCORDING TO GENDER : (N = 100)

GENDER	NO. OF SUBJECTS
MALE	43
FEMALE	57

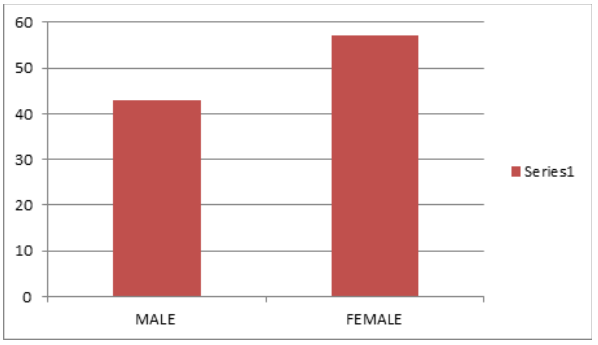
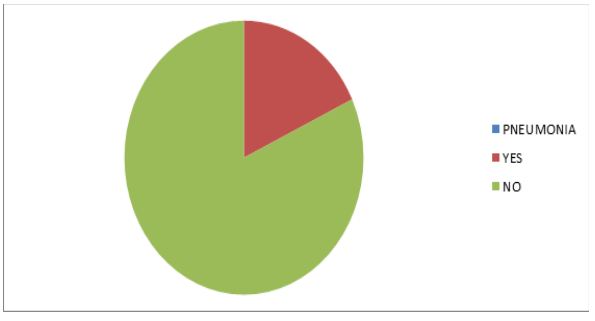


TABLE 3 : DISTRIBUTION OF SUBJECTS ACCORDING TO OCCURRENCE OF PNEUMONIA AFTER VIT.C ADMINISTRATION : (N = 100)

PNEUMONIA	NO .OF SUBJECTS
YES	16
NO	84



DISCUSSION

Out of 100 patients in the study, 34% are in the age group of 41-60 years, 30% are in the age group more than 60 years, 26% are in the age group of 21-40 years, and 10% are in the age group 18-20 years. Out of 100 patients 43% were males and 57% were females. After administration of tab vitamin C 500mgs four times a day for 7 days , out of 100 patients 16% of patients developed evidence of pneumonia on chest X ray in ICU care and 84% of patients did not had pneumonia. It is seen from the above study that , 100 patients belonging to different age groups admitted to the intensive care unit for various causes when treated with a vitamin C in the therapeutic dose of 2 grams per day , 18 of them developed pneumonia and the remaining 84 of them were not seen to develop pneumonia. Thus it seems that there exists an association between the intake of vitamin C in large doses and prevention of pneumonia in patients admitted in the ICU. This association could be proved by matching the cases with appropriate controls and applying various statistical tests to prove association between the two.

CONCLUSION

Thus from the above study it is seen that the use of Vitamin C could be used as a preventive measure in reducing the incidence of pneumonia in hospitalized patients. It is usually assumed that the physiological role of vitamin C is simply to prevent scurvy. So far, the strongest evidence for the non-scorbutic effects of vitamin C is the large number of trials on common cold . There is firm evidence that regular vitamin C supplementation reduces common cold in general population. Some studies have shown results that Vitamin C supplementation has helped in treatment of pneumonia. This also raises possibility of its role in preventing pneumonia in people susceptible to nocosomial infection. Its occurrence increases length of hospital stay and thus increasing hospital expenditure. In order to avoid this vitamin C can act as inexpensive preventive treatment to decrease incidence on nosocomial infection

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