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Targeted Therapy Vs Empirical Therapy in Treating Respiratory Pathogen Associated with Co Morbidity

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ABSTRACT

The main aim of the study to evaluate the association between co morbid conditions with respiratory tract infections and assess the targeted therapy in treating respiratory pathogens associated with co morbidity. We performed a prospective observational study, evaluating respiratory tract infectious patients, with or without co morbidity. This study was carried out during June 2013 to October 2013. Among 170 RTIs patients enrolled in the study, in that 11(6.5%) were diagnosed with Cardiovascular diseases, 51(30%) with Endocrine disorders, 9 (5.3%) with Hepatic diseases, 7 (4.12%) patients with Genito urinary diseases, 6 (3.53%) with Autoimmune disorders, 25 (14.7%) with Respiratory diseases, 1 (0.59%) patients with immunocompromised diseases and 10 (5.88%) patients with central nervous system diseases. Among 170 patients, in that 120 (70.59%) RTIs patients with co morbidity and 50 (29.41%) normotensive patients without co morbidity. Antibiotics were given as empirical therapy and targeted therapy RTIs patient with co morbidity, in that 91(53.53%) treated as empirically and 29(17.06%) as targeted therapy. The patients with diabetes mellitus had greater risk of developing RTIs. When a patient reports a RTI with co morbidity, it is necessary to identify and assess the co morbidity so as to prevent further complications and irrational therapy. Hence, for patients with RTIs and co morbidity, it is very essential to perform the culture and sensitivity pattern.

Key words: RTIs, Co morbidity, Empirical therapy, Targeted therapy.

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INTRODUCTION

Empirical antimicrobial treatment should be initiated based on the most likely pathogen and the antimicrobial susceptibility of the pathogen as well as the patient's age, co morbidities, concomitant medications severity of illness and any medication allergies the patient may have. A recent analysis of US medical hospitalization rates showed improved outcomes with initiation of antimicrobial therapy within 4 hours of arrival at the hospital [1].

Respiratory infections can also aggravate common chronic respiratory conditions, such as asthma and chronic obstructive pulmonary disease (COPD), and chronic medical conditions, such as heart failure. In addition to impacting the very young and the elderly, RID has a major impact on: patients already suffering from chronic illness (e.g. young patients with cystic fibrosis); patients with immunosuppression caused by disease or treatment[2]. Some people will be at greater risk of developing complications from RTIs and becoming more seriously ill e.g.: People aged 5 to 65 years with chronic lung disease, chronic heart disease, chronic kidney disease, chronic liver disease, chronic neurological disease, Immuno-suppression (whether caused by disease or treatment), Diabetes mellitus, Pregnant women and People aged 65 years and older[3].

RID is common and can be a direct or indirect cause of illness. Management of RID is largely sub-optimal and the problems posed by respiratory infections are greatly compounded by severe limitations in diagnostic techniques and a relatively poor understanding of pathogenic mechanisms. In particular, there is a lack of effective diagnostic and therapeutic strategies for most viral pathogens and an increasing number of multi-resistant bacteria. The threats posed by emerging respiratory infections and limited development of new antimicrobial drugs can only worsen this situation [2].

Diabetes mellitus (DM) has been associated with increased rates of infections, which may be partially explained by a decreased T cell–mediated immune response. Impaired neutrophil function associated with diabetes has also been documented, although this is currently being debated. Some studies have shown that both common and rare infections are more prevalent among patients with diabetes than among the general population, whereas other studies have not observed such an association[4].

Respiratory tract infections are a common and important cause of morbidity and mortality worldwide[5].Respiratory tract infection (RTIs) is defined as any infectious disease of the upper or lower respiratory tract. Upper respiratory tract infections (URTIs) include common cold, laryngitis, pharyngitis/tonsillitis, acute rhinitis, acute rhino sinusitis and acute otitis media.

Lower respiratory tract infections (LRTIs) include acute bronchitis, bronchilitis, pneumonia and tracheitis[6].Most respiratory tract infections are treated empirically, perhaps due to the higher cost of laboratory services or non availability of standardized laboratories[7]

The main aim of the study to evaluate the association between co morbid conditions with respiratory tract infections and assess the targeted therapy in treating respiratory pathogens associated with co morbidity.

MATERIALS AND METHODS:

Hospital settings:

Karuna medical college and hospital, it is a tertiary care teaching hospital, Chittur, Palakkad. Karuna medical college is a 500 bedded multi speciality tertiary care teaching hospital offers affordable and health care services to the patients.

Study population:

We evaluated all patients with respiratory tract infections in various departments. The various departments are General medicine, OBG and ENT, excluding those who hasn't given consent to participate in the study and patients below the age group of 18 years.

Table 1 Patient characteristics :

Characteristics	Number	Percentage
Sex:		
Male	101	59.42
Female	69	40.58
Departments:		
General medicine	99	58.23
OBG	3	1.76
ENT	68	40.00
Co morbidity	120	70.59
Total number of prescriptions	170	100
Prescriptions with culture and sensitivity test	36	21.18

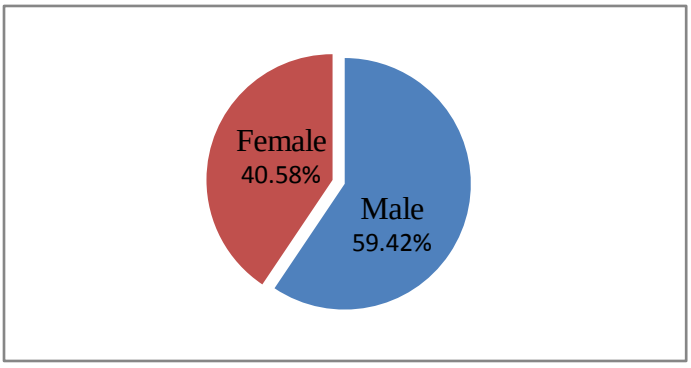

Figure 1 Gender distribution

Study Design:

We performed a prospective observational study, evaluating respiratory tract infectious patients, with or without co morbidity. This study was carried out during June 2013 to October 2013.Patient data collection form was prepared based on the study objectives.

Data collection:

The following Patient's demographic variables were analysed, including sex, age, and co morbidity. Prescriptions were classified as 'empirical' when the pathogen was unknown at the time of prescription and as 'targeted' when the pathogen was identified. All data were collected by patient chart review.

Ethics:

Approval by the ethics committee (GCP/IEC/444/2013) was obtained. The head of the various departments and their physician's staff were prospectively informed about the study, and accepted the evaluation methods.

Statistical analysis:

The data were entered into Microsoft excel and analyzed with Graph Pad Prism Soft ware.

RESULTS AND DISCUSSION

A total 170 patients enrolled in the study. The common cases for antibiotics prescribed were infections like pharyngitis, acute rhinitis, tonsillitis, sinusitis, bronchitis, tuberculosis, bronchial asthma and chronic obstructive pulmonary disease. Out of total 170 prescriptions, 101(59.42%) were for male patients and 69(40.58%) were for female patients.

Among 170 RTIs patients enrolled in the study, in that 11(6.5%) were diagnosed with Cardiovascular diseases, 51(30%) with Endocrine disorders, 9 (5.3%) with Hepatic diseases, 7 (4.12%) patients with Genito urinary diseases, 6 (3.53%) with Autoimmune disorders, 25 (14.7%) with Respiratory diseases, 1 (0.59%) patients with immunocompromised diseases and 10 (5.88%) patients with central nervous system diseases.

Table 2 Prevalence of Co morbidities in RTIs

Co- morbidities	No of patients	Percentage	Mean ±SD
Cardiovascular diseases	11	6.5 %	15±16.09
Endocrine disorders	51	30%	15±16.09
Hepatic diseases	9	5.3%	15±16.09
Genitor urinary diseases	7	4.12%	15±16.09
Autoimmune disorders	6	3.53%	15±16.09
Respiratory diseases	25	14.7%	15±16.09
Immunocompromised diseases	1	0.59%	15±16.09
Central nervous system diseases	10	5.88%	15±16.09

Table 3 Treatment pattern RTIs patients with Co morbidity

Conditions	No. of Empirical therapy	Percentage	No. of Targeted therapy	Percentage
Comorbidity with RTIs	91	53.53	29	17.06
Normotensive with RTIs	43	25.29	7	4.12

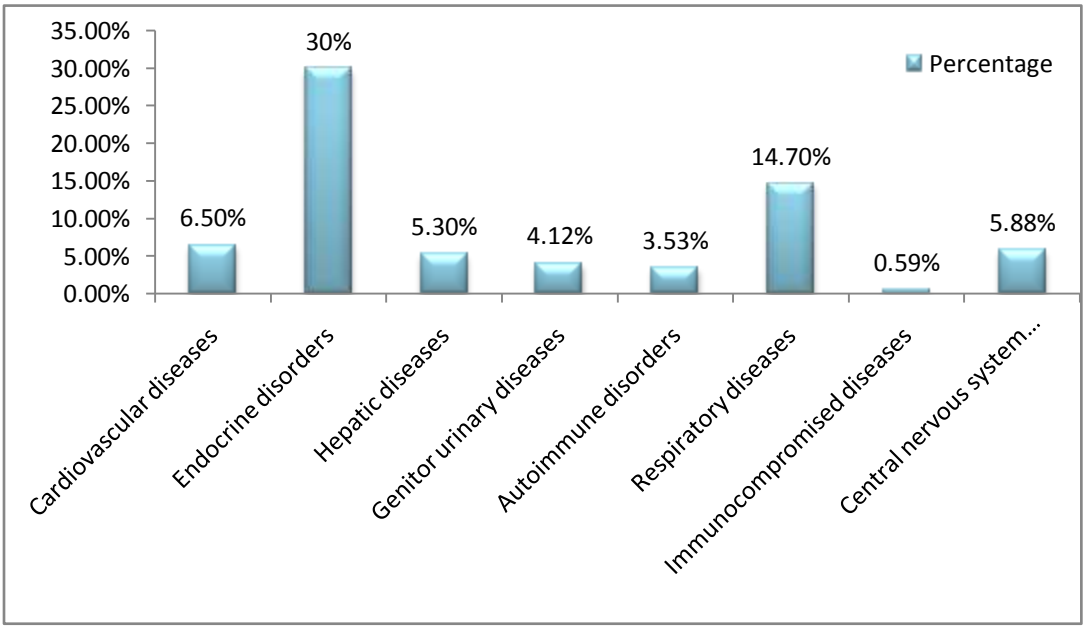

Figure 2 Prevalence of Co morbidity in RTIs

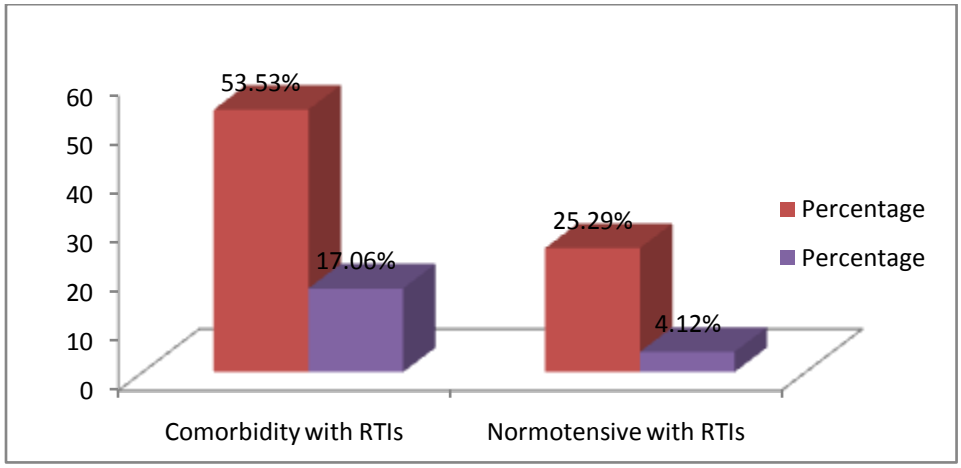

Figure 3 Treatment pattern of RTIS patients with Co morbidity

Among 170 patients, in that 120 (70.59%) RTIs patients with co morbidity and 50 (29.41%) normotensive patients without co morbidity. Antibiotics were given as empirical therapy and targeted therapy RTIs patient with co morbidity, in that 91(53.53%) treated as empirically and 29(17.06%) as targeted therapy.

CONCLUSION:

The patients with diabetes mellitus had greater risk of developing RTIs. When a patient reports a

RTI with co morbidity, it is necessary to identify and assess the co morbidity so as to prevent further complications and irrational therapy. Hence, for patients with RTIs and co morbidity, it is very essential to perform the culture and sensitivity pattern.

The study recommends the following certain necessary steps for a RTI patients presenting with a co morbidity to avoid further recurrence and complications.

1) Duration of hospital stay
2) Economic burden
3) Immediate reporting to hospital

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