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Original Research Article

Examination of Electrolyte Balance during Acute Exacerbations of COPD

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Abstract:

Background & Method: All patients admitted in Respiratory Medicine ward of GMCH, Bettiah. with diagnosis of Acute Exacerbation of COPD. Study will be conducted on 86 patients of acute exacerbation of COPD from the Department of TB and Chest at GMCH, Bettiah. and 20 age- sex matched healthy community control.

Result: The mean age of 86 patients diagnosed with acute exacerbation of COPD and fulfilled all inclusion criteria (Cases) was 60.7 ± 11.5 and mean age in the Healthy control group was 59.75 ± 6.65. The difference was found to be statistically not significant with a P-value of 0.735. The mean Serum Sodium of Patients in the Case Group was 128.85 ± 3.17 and that of the control group was 138.81 ± 1.69. The mean Serum Potassium of Patients in the Case Group was 3.293 ± 0.684 and that of thecontrol group was 4.191 ± 0.272. The mean FEV1 of Patients in the Case Group was 51.8 ± 10.2 and that of the control group was 87.30 ± 4.96.

Conclusion: Electrolyte imbalances are quiet common during acute exacerbations of COPD Routine Serum electrolytes shouldbe done in all patients admitted with acute exacerbation of COPD and should be corrected if necessary. Routine screening forelectrolyte imbalances and correction are very necessary as it reduces the quality of life, increases exacerbations following oneyear and even may cause mortality.

Keywords: Tuberculosis, Drug Resistance & Incidence.

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Introduction

Chronic obstructive pulmonary disease (COPD) is a lung disease characterized by chronic obstruction of lung airflowthat interferes with normal breathing and is not fully reversible. COPD is one of the leading causes of morbidity and mortality worldwide and imparts a substantial economicburden on individuals and society. [1] COPD has been defined by GOLD as a disease state characterized by airflow limitation that is not fully reversible. The airflow limitation is usually both progressiveand associated with an abnormal inflammatory response of the lungs to noxious particles or gases. COPD includes chronic bronchitis and emphysema. Chronicbronchitis is defined as "the presence of a chronic productivecough on most days for three months, in each of two consecutive years".[2] Emphysema is defined as abnormal, permanent enlargement of the distal air spaces, distal to the terminal bronchioles, accompanied by destruction of their walls and without obvious fibrosis. COPD is present only if chronic airflow obstruction occurs; chronic bronchitis without chronic airflow obstruction is notincluded within COPD. [3] Most of the information available onCOPD prevalence, morbidity and mortality comes from developed countries. Even in these countries, accurate epidemiological data on COPD are difficult and expensive to collect. Prevalence and morbidity data greatly underestimate the total burden of COPD because the disease is usually not diagnosed until it is clinically apparent and moderately advanced. [4]

Material and Method

All patients admitted in Respiratory Medicine ward of Government Medical College and Hospital, Bettiah with diagnosis of Acute Exacerbation of COPD were selected for the study.

Study will be conducted on 86 patients of acute exacerbationof COPD from the Department of TB and Chest at GMCH, Bettiah. and 20 age- sex matched healthy community control. Subjects were included on the basis of their diagnosis of COPD as per GOLDguidelines. Unrelated causes of dyselectrolytemia other than COPD or its management like known cases of chronic renal failure, diabetic ketoacidosis, adrenocortical insufficiency, cerebral salt wasting were excluded from the study. Disease free 20 healthy volunteers from the community were examined as controls.

Inclusion Criteria

1. Patients more than 45years of age with clinical diagnosis of COPD since at least last 1 year.

2. As per GOLD guidelines, any patient who has symptoms of chronic cough, sputum production or dyspnea, the valuesof FEV1< 80% of the expected

value and FEV1/ FVC < 070% after post bronchodilator inhalation.

3. Patients with acute episodes (as diagnosed according to thecriteria).

Exclusion Criteria

1. Recent myocardial infarction < 4months.
2. Unstable angina.
3. Congestive heart failure (NYHA class III or IV).
4. Inability to perform spirometry or 6 minute walk test.
5. Unrelated life-threatening major illness.
6. Liver disease.
7. Patients with acute exacerbation.
8. Female sex.

Results

Table 1: Age Distributions of Patients

Group	N	Mean	Standard Deviation	SE Mean	T value	DF	P value
Case	66	60.7	11.5	1.4	0.34	84	
Control	20	59.75	6.65	1.5			0.735

The mean age of 86 patients diagnosed with acute exacerbation of COPD and fulfilled all inclusion criteria (Cases) was 60.7 ± 11.5 and mean age in the Healthy control group was 59.75 ± 6.65. The difference was found to be statistically not significantwith a P-value of 0.735.

Table 2: Mean Serum Sodium in the Study Group

Group	N	Mean	Standard Deviation	SE Mean	T value	DF	P value
Case	66	128.85	3.17	0.39			< 0.00001
Control	20	138.81	1.69	0.38	-13.45	84	

The mean Serum Sodium of Patients in the Case Group was 128.85 ± 3.17 and that of the control group was 138.81 ± 1.69.

Table 3: Mean Serum Potassium in the Study Group

Group	N	Mean	Standard Deviation	SE Mean	T value	DF	P value
Case	66	3.293	0.684	0.084			< 0.00001
Control	20	4.191	0.272	0.061	-5.72	84	

The mean Serum Potassium of Patients in the Case Group was 3.293 ± 0.684 and that of the control group was 4.191 ± 0.272.

Table 4: Comparison of Mean FEV1 in the Study Group

Group	N	Mean	Standard Deviation	SE Mean	T value	DF	P value
Case	66	51.8	10.2	10.2			< 0.00001
Control	20	87.30	4.96	4.96	-14.97	84	

The mean FEV1 of Patients in the Case Group was 51.8 ± 10.2 and that of the control group was 87.30 ± 4.96.

Discussion

Persistent obstructive aspiratory illness (COPD), a typical sickness portrayed by an inadequately reversible impedimentin wind stream, is anticipated to be the third most successivereason for death on the planet by 2020.The danger of death in patients with COPD increments with the seriousness of infection, which is frequently evaluated with the utilization of a solitary physiological variable, the constrained expiratory volume in one second (FEV1). [5]

Notwithstanding, other danger factors, for example, the presence of hypoxemia or hypercapnia, a brief distance strolled in a decent time, a serious level of useful shortness of breath, a low weight list, Hyponatremia, Hypokalemia, are additionally connected with an expanded danger of death. Amulti-dimensional evaluating framework that surveyed the respiratory, viewpoint, and foundational parts of COPD is relied upon to all the more likely classify the ailment and foresee the result than does the FEV1alone. [6] BODE file is valuable since it incorporates one area that measures the level of pneumonic debilitation (FEV1), one that catches the patient's view of side effects (the MMRC dyspnea scale), and two free spaces (the distance strolled in a short time and the weight record) that express the foundational results of COPD. In this review BODE file is utilized to evaluate the seriousness of COPD and Categorize COPD cases into gentle, moderate and extreme cases. Concentrates by Celli etal and Kian Chung et al have demonstrated that gathering COPD patients into three gatherings with BODE scores 0 – 2 as Mild COPD bunch, 3 – 5 as Moderate and at least 6 as the Severe gathering associates well with seriousness as far as hospitalization and dreariness. Henceforth, this review hasembraced a similar grouping. [7,8]

Conclusion

Electrolyte imbalances are quiet common during acute exacerbations of COPD Routine Serum

electrolytes should be done in all patients admitted with acute exacerbation of COPD and should be corrected if necessary. Routine screening for electrolyte imbalances and correction are verynecessary as it reduces the quality of life, increases exacerbations following one year and even may cause mortality.

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