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A STUDY ABOUT THE MORTALITY RATE IN THE ACUTE EXACERBATIONS IN PATIENTS DIAGNOSED WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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ABSTRACT
The objective of this retrospective study was to obtain epidemiological data from 72 patients who died because of an acute exacerbation of chronic obstructive pulmonary disease in Damascus hospital. Moreover, this research aims to study the reason of the acute exacerbation, which lead to death. The frequency of smoking habits, and the infectious causes and non-infectious causes and mortality rate were determined and then compared to other studies. Mortality was more common between males who tend to smoke more than 60 packs/year. The most common affected age category was above 60 years old. The most common cause of the acute exacerbation, which lead to death, was pneumonia 66.66%.

INTRODUCTION
Chronic Obstructive Pulmonary Disease (COPD) is currently the fourth leading cause of death in the world.[1] but is projected to be the 3rd leading cause of death by 2020. More than 3 million people died of COPD in 2012 accounting for 6% of all deaths globally. COPD represents an important public health challenge that is both preventable and treatable. COPD is a major cause of chronic morbidity and mortality throughout the world; many people suffer from this disease for years, and die prematurely from it or its complications. Globally, the COPD burden is projected to increase in coming decades because of continued exposure to COPD risk factors and aging of the population.[2]

Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases.

The chronic airflow limitation that is characteristic of COPD is caused by a mixture of small airways disease (e.g., obstructive bronchiolitis) and parenchymal destruction (emphysema), the relative contributions of which vary from person to person.

The main risk factor for COPD is tobacco smoking but other environmental exposures such as biomass fuel exposure and air pollution may contribute. Besides exposures, host factors predispose individuals to develop COPD. These include genetic abnormalities, abnormal lung development and accelerated aging.

COPD may be punctuated by periods of acute worsening of respiratory symptoms, called exacerbations.

In most patients, COPD is associated with significant concomitant chronic diseases, which increases its morbidity and mortality.

MATERIALS AND METHODS
This was a retrospective study of the records of patients who were admitted in the pulmonology department in Damascus Hospital, and were diagnosed with COPD and underwent an acute exacerbation which lead to death. We collected data regarding the age, gender, smoking habits, symptoms, acidosis, blood gases, and sepsis of the patients.

This study included all cases from 24\3\2015 until 18\10\2019. Statistical analysis was done using SPSS 25.0.

RESULTS
Table 1: Chronic Obstructive Pulmonary Disease Distribution By Sex.

		N
chronic obstructive pulmonary disease distribution by sex:	Male	714
	Female	194
	Total	908

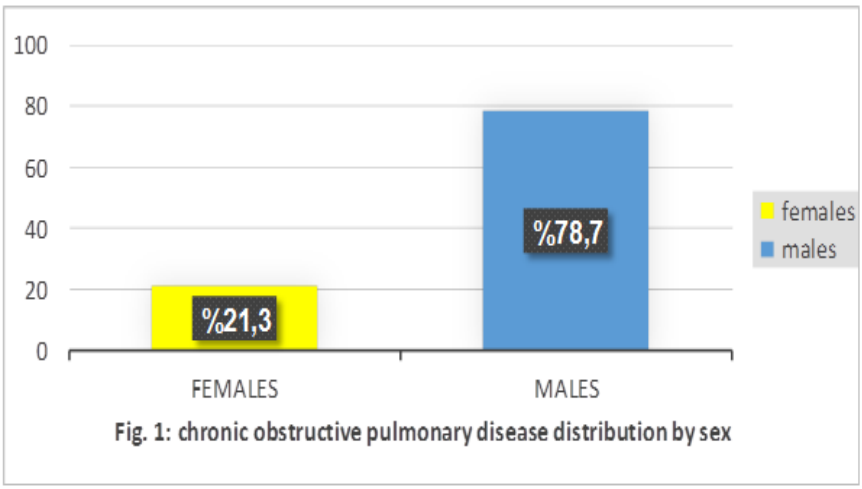

Fig. 1: chronic obstructive pulmonary disease distribution by sex

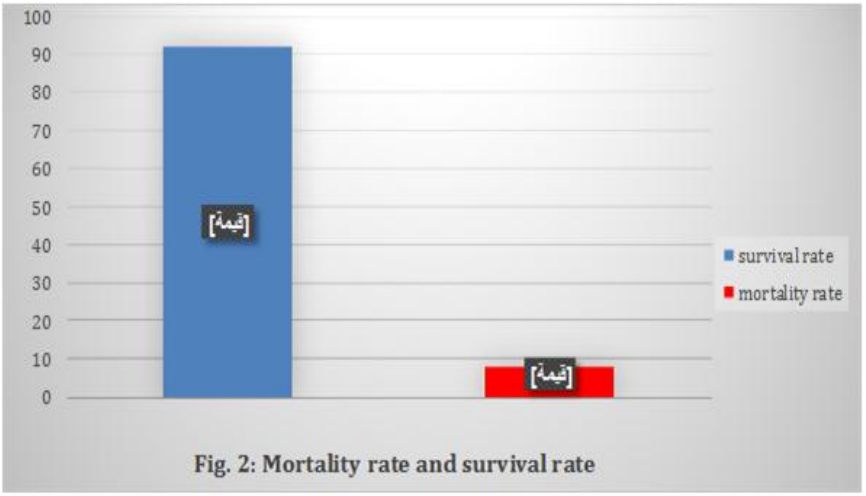

Fig. 2: Mortality rate and survival rate

Table 2: Distribution of mortality rate by sex.

		N
Distribution of mortality rate by sex:	Male	52
	Female	20
	Total	72

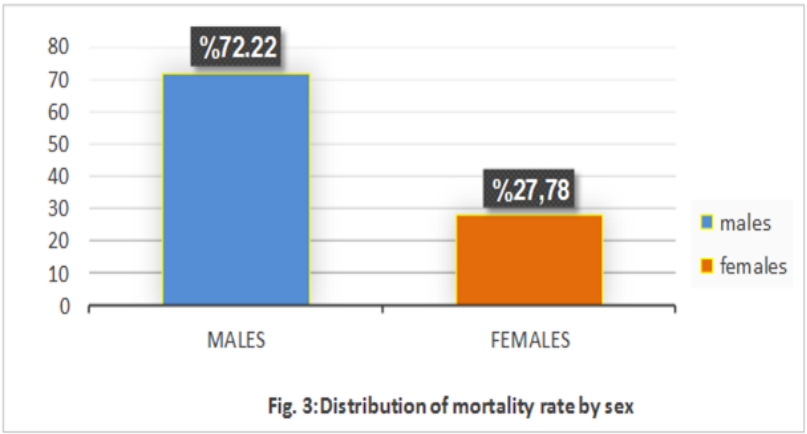

Fig. 3: Distribution of mortality rate by sex

Male mortality: 714 sick males - 52 male deaths

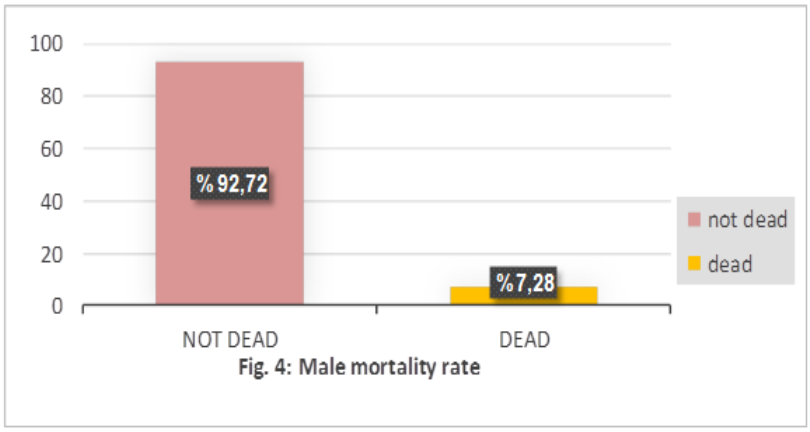

Fig. 4: Male mortality rate

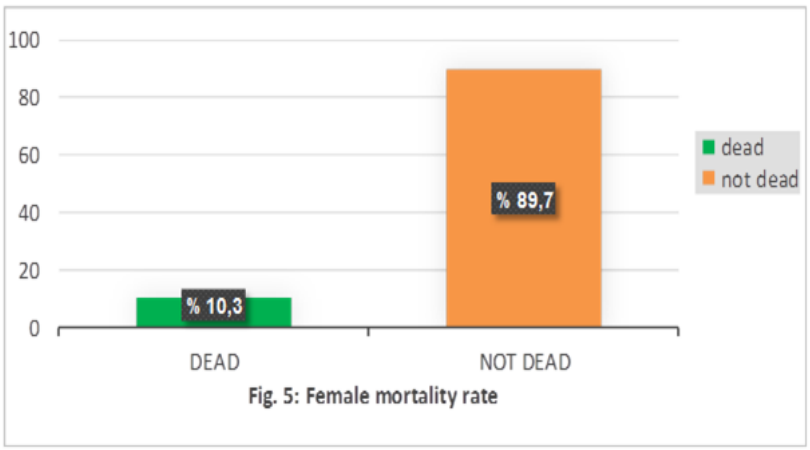

Fig. 5: Female mortality rate

Female mortality: 194 sick females - 20 female deaths

Table 3: Mortality rate distribution by age category.

		N
Mortality rate distribution by age category	Less or equal 60	22
	More than 60	50
	Total	72

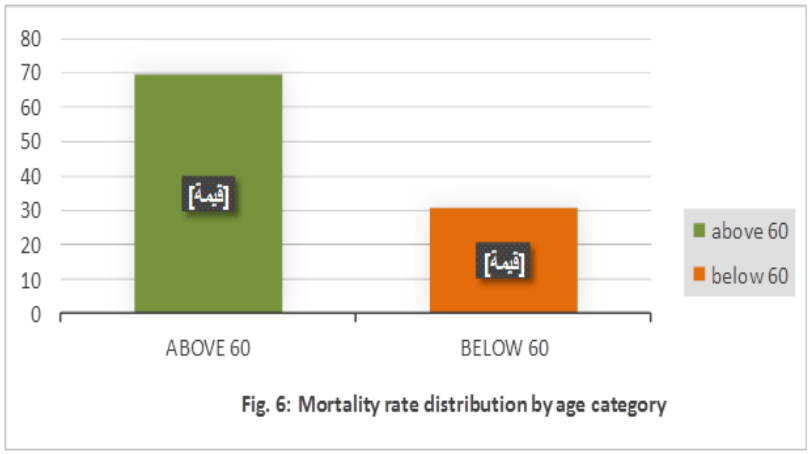

Fig. 6: Mortality rate distribution by age category

Table 4: Mortality rate of smoking patients.

		N
Mortality rate of smoking patients	Smoker	50
	Non smoker	22
	Total	72

Fig. 7: Mortality rate of smoking patients

Table 5: Mortality rate distribution of smoking patients by sex.

		N	p.v
Mortality rate distribution of smoking patients by sex	Male smoker	42	**0.000701**
	Male non smoker	10	
	Female smoker	8	
	Female non smoker	12	
	Total	72	

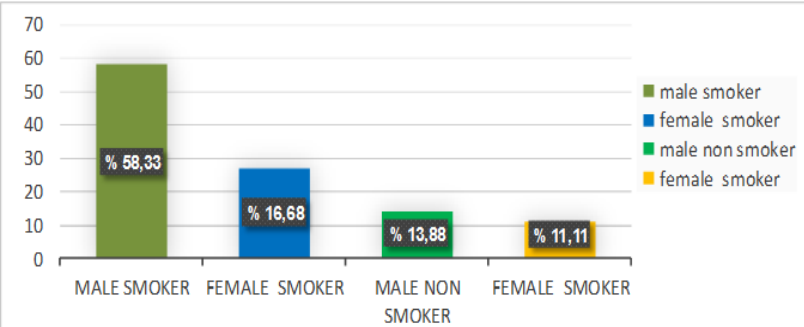

Fig. 8: Mortality rate distribution of smoking patients by sex

Table 6: Mortality rate distribution by smoking in pack/years.

		N
Mortality rate distribution by smoking in pack/years	1-20	0
	20-40	12
	40-60	10
	More than 60	28
	Total	50

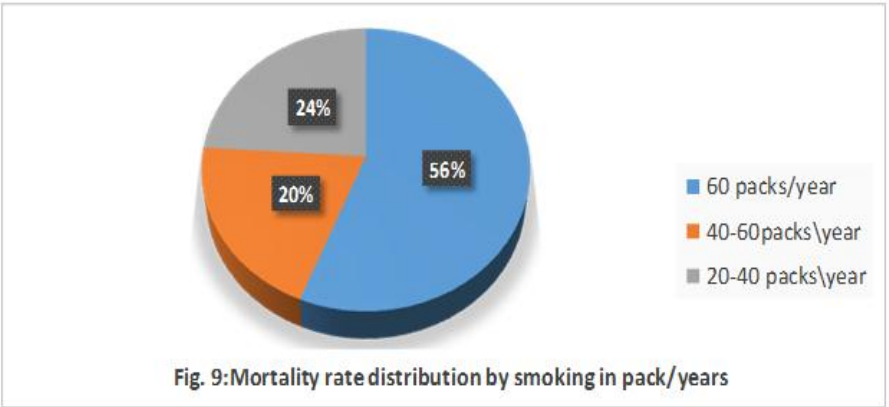

Fig. 9:Mortality rate distribution by smoking in pack/years

Table 7: Mortality rate distribution in patients using automatic ventilation.

		N
Mortality rate distribution in patients using automatic ventilation	Yes	58
	No	14
	Total	72

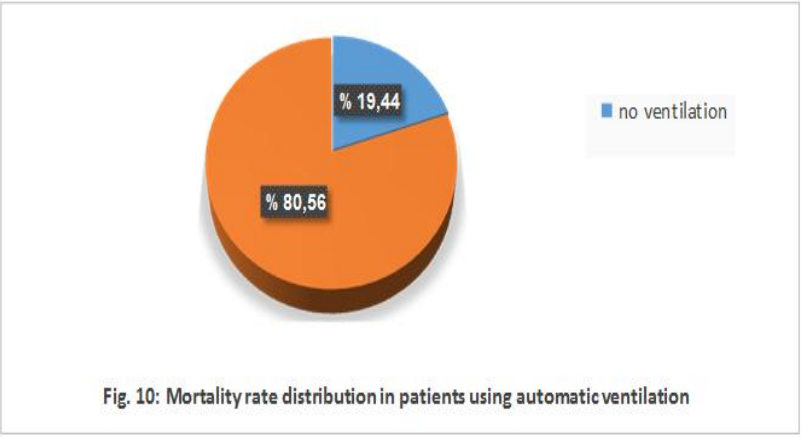

Fig. 10: Mortality rate distribution in patients using automatic ventilation

Table 8: Mortality rate in Patients with acidosis at admission.

		N
Mortality rate in Patients with acidosis at admission	Yes	52
	No	20
	Total	72

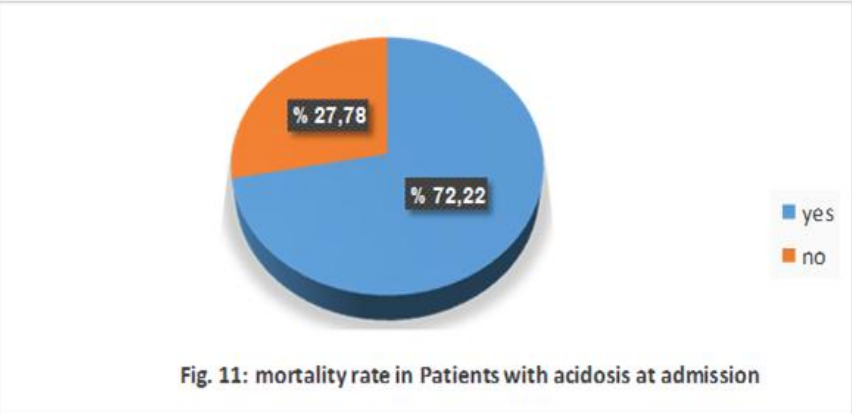

Fig. 11: mortality rate in Patients with acidosis at admission

Table 9: Mortality rate in Patients with acidosis before death.

		N
mortality rate in Patients with acidosis before death	Yes	58
	No	14
	Total	72

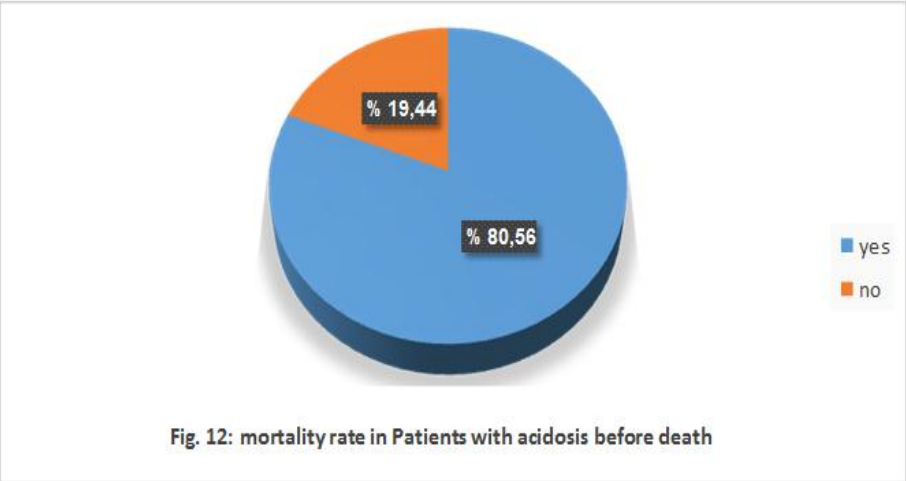

Fig. 12: mortality rate in Patients with acidosis before death

Table 10: Duration of hospitalization (days) before death.

		N
Duration of hospitalization (days) before death	Less or equal 5	40
	More than 5	32
	Total	72

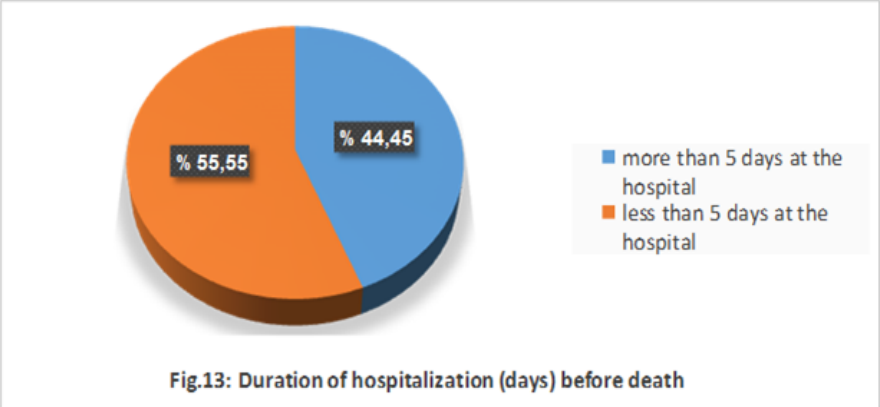

Fig.13: Duration of hospitalization (days) before death

Table 11: Mortality rate in patients with Antibiotic coverage.

		N
Mortality rate in patients with Antibiotic coverage	Yes	50
	No	22
	Total	72

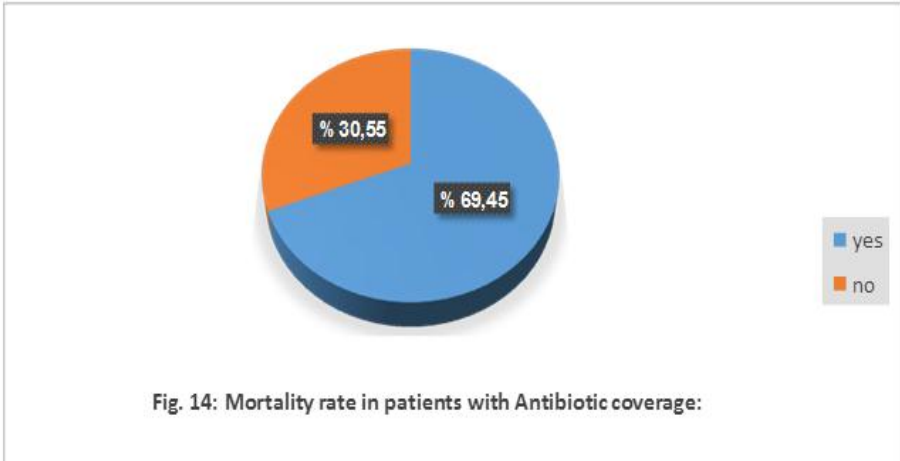

Fig. 14: Mortality rate in patients with Antibiotic coverage:

Table 12: Cause of death.

		N
Cause of death:	Infection	48
	Non Infection	24
	Total	72

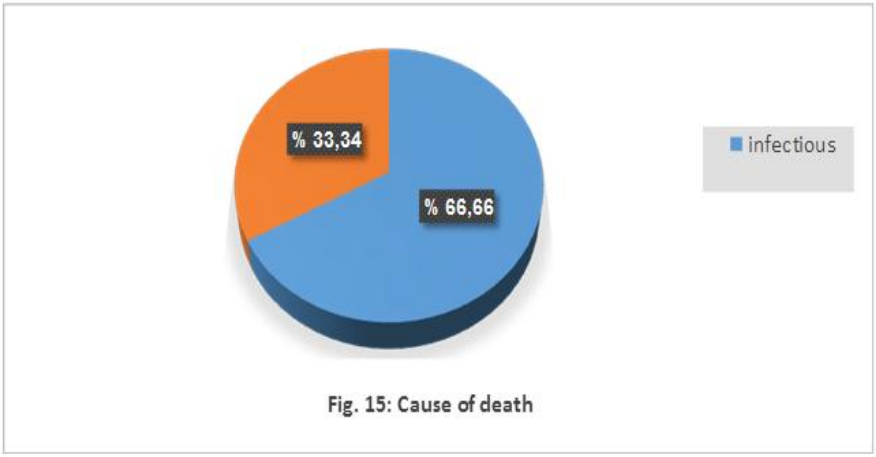

Fig. 15: Cause of death

Table 13: Causes of non-infectious death.

		N
Causes of non-infectious	Multiple organ failure	6
	Heart infarction	6
	Cholestasis	3
	Pulmonary embolus	3
	Unresponsive hyper carbon blood	2
	Arrhythmia	2
	Small cell lung tumor	1
	Recurrent lymphoma	1
	Total	24

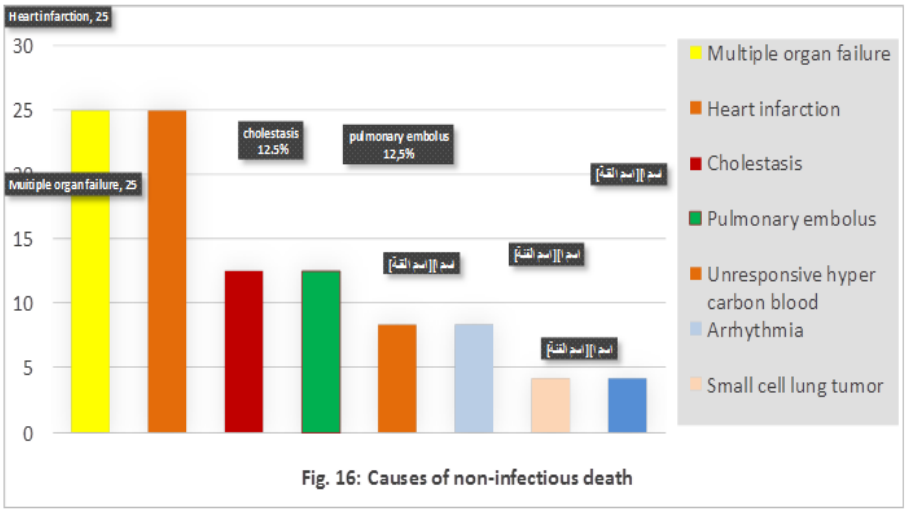

Fig. 16: Causes of non-infectious death

Table 14: The relation between infection and smoking at death.

		N
The relation between infection and smoking at death	has infection and smoker	34
	has infection and nonsmoker	14
	Total	48

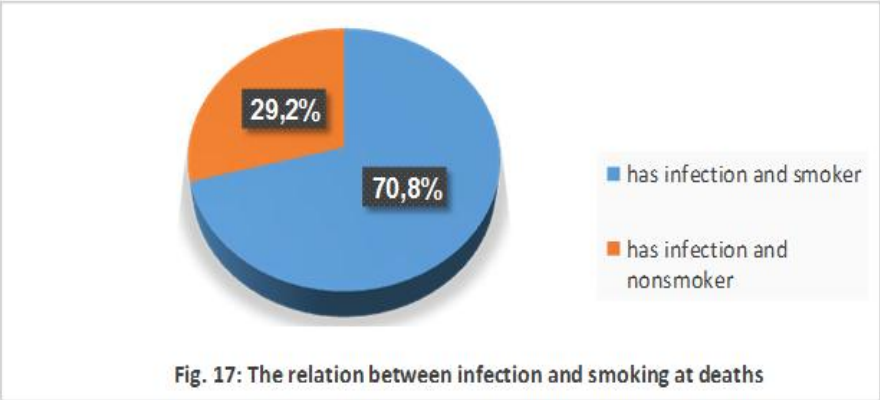

Fig. 17: The relation between infection and smoking at deaths

Table 15: Type of Respiratory failure at death.

		N
Type of Respiratory failure at death:	No Failure	16
	Type 1	12
	Type 2	44
	Total	72

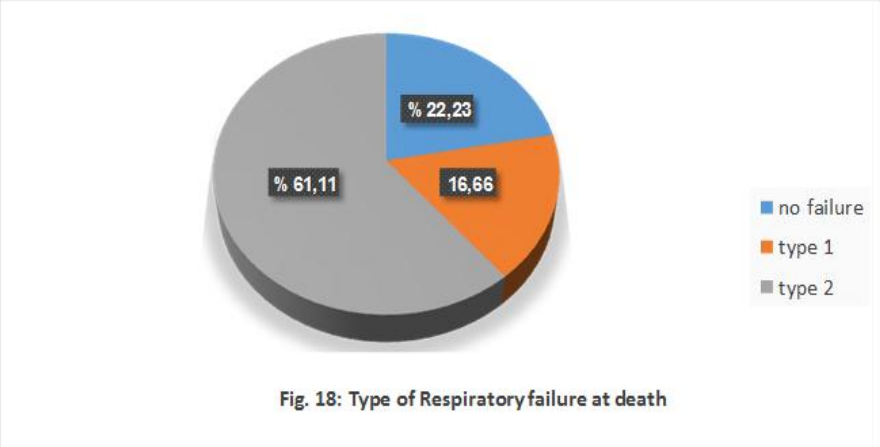

Fig. 18: Type of Respiratory failure at death

Table 16: Molecular pressure of oxygen at death.

		N
Po2 at death	Less than 75	66
	Normal	4
	More than 100	2
	Total	72

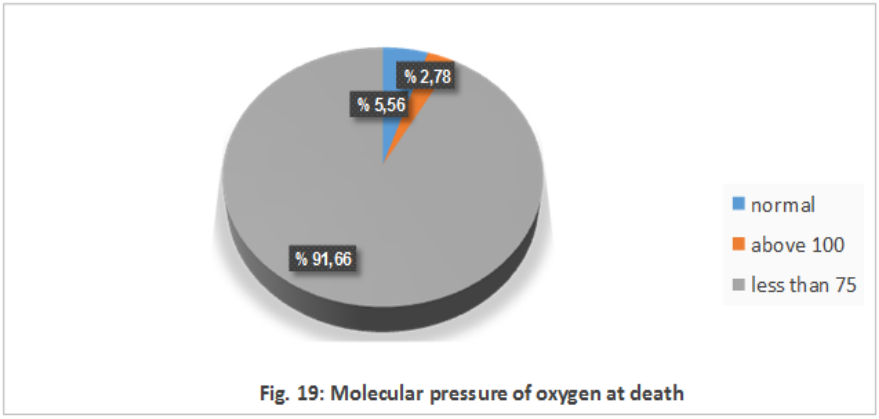

Fig. 19: Molecular pressure of oxygen at death

Table 17: The relation between not smoking and hospitalization (days) at death:

		N	p.v
The relation between not smoking and hospitalization (days) at death	**Less than 5**	8	0.288953
	More than 5	14	
	Total	22	

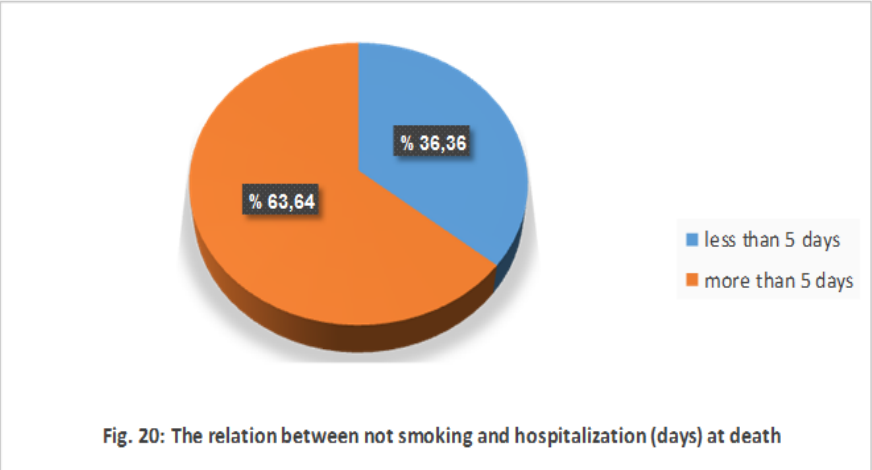

Fig. 20: The relation between not smoking and hospitalization (days) at death

Table 18: The relation between smoking and hospitalization (days) at death.

		N	p.v
The relation between smoking and hospitalization (days) at death	Less than 5	32	0.288953
	More than 5	18	
	Total	50	

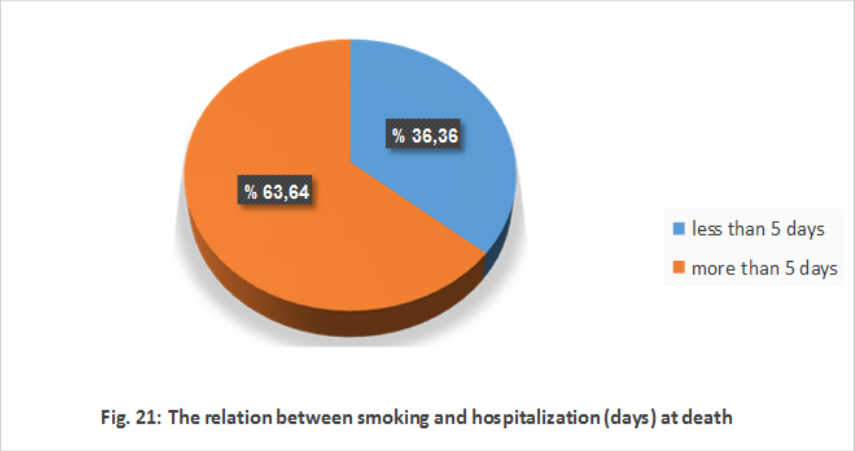

Fig. 21: The relation between smoking and hospitalization (days) at death

Table 19: The relation between non-smoking and automatic ventilation at death.

		N	p.v
The relation between nonsmoking and automatic ventilation at death:	Less than 5	18	0.985351
	More than 5	4	
	Total	22	

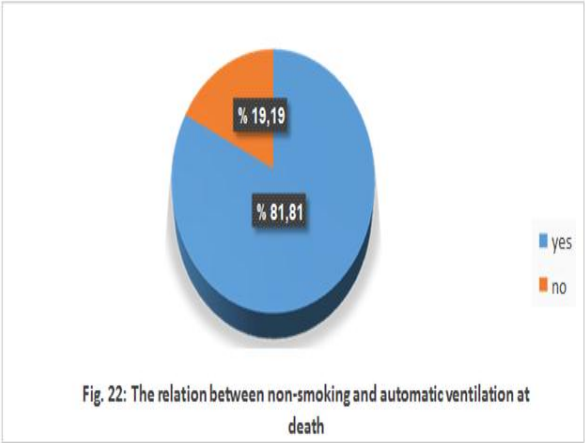

Fig. 22: The relation between non-smoking and automatic ventilation at death

Table 20: The relation between smoking and automatic ventilation at death.

		N	p.v
The relation between smoking and automatic ventilation at death	Less than 5	40	0.985351
	More than 5	10	
	Total	50	

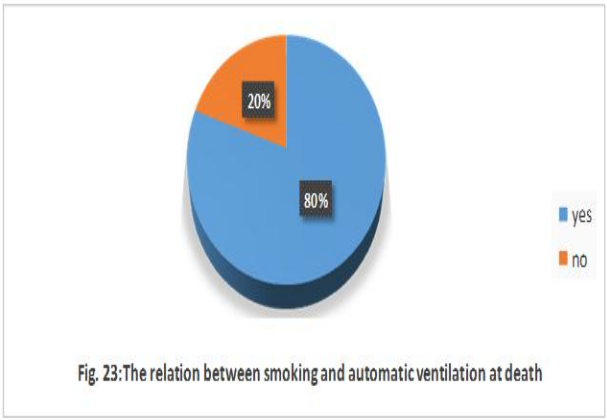

Fig. 23:The relation between smoking and automatic ventilation at death

Table 21: Mortality rate in vaccinated patients.

		N
Mortality rate in vaccinated patients	Vaccinated	0
	Non vaccinated	72
	Total	72

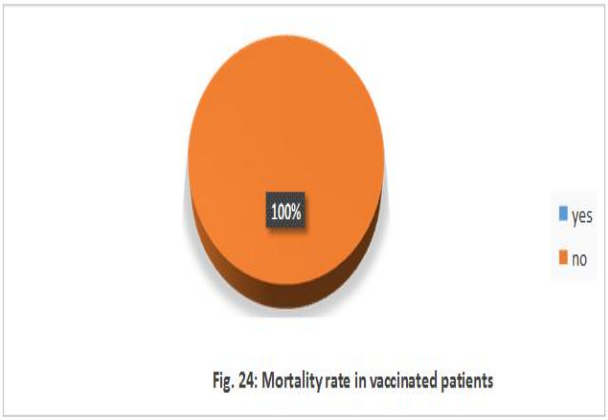

Fig. 24: Mortality rate in vaccinated patients

DISCUSSION

1. It was found in our study that the percentage of male patients was 78,7% compared to females 21,3%,while in study done by(ka pang chan,fanny w.ko) in xuzhou in china at 2008 the Percentage of male patients was 48% compared to females at 52%[3] moreover, in a study done by (2)Cherbuin N(1), Walsh EI(1), Prina AM at University, Canberra, Australia Australian National the percentage of female patients was 62% compared to males with 38%.[4]
2. It was found in our study the infectious cause which to lead to the acute exacerbation was at a percentage of 67% compared to the same pre mentioned study in xuzhou china which was at a percentage of 81%.[3]
3. It was found in our study that the mortality rate due to an acute exacerbation was 7,9% compared to a study done by Aran Singanayagam1, Stuart Schembri2, and James D. Chalmers2 in Saint Mary's Hospital in London which had a 3,6% mortality rate.[5]

Moreover,the mortality rate in the pre mentioned study in Australia was at a percentage of 14% [4]. And a study at the devon royal hospital in barcelona spain showed that the percentage of death due to an acute exacerbation was 5%.[6]

4-it was found in our study that the cause of death differed between 66,66%infectious and 33,34% noninfectious. between the noninfectious causes the percentage was like the following (MI 25%,pulmonary embolism 12,5%,arrhythmias 7,5%,respiratory failure 8,33%,lung cancer 4,17%)compared to a study done by (Sin, N. R. Anthonisen, J. B. Soriano, A. G. Agust) published at the european respiratory health magazine in 2006[7] the death non infectious reason was like the following (MI 6%,pneumonia 11%,arrhythmias 8%,lung cancer 7%,pulmonary embolism 10%,respiratory failure 38%,others 7%)

CONCLUSION

Mortality was more common between males whom tend to smoke more than 60 packs\year.

The most common affected category was above 60 years.the most common cause of the acute exacerbations which lead to death was infectious 66.66% compared to non infectious cause 33,34%.

The mortality rate was 7,9% (72,22%males-27,78 females)

Limitations

-We were unable to access patient's data before 2015 due to lack of patients files prior to this year.

-We were unable to communicate with patients if some data was missing

.-Small sample size: The sample size represents only one hospital in our country, we could have had a bigger idea of the problem if there was a large database of several health centers. -Difficulty in collecting data from sample records because some important information was not recorded by the medical staff or wrongly recorded.

Recommendations

1. Encourage smokers to quit smoking because of the correlation between COPD and smoking.
2. Vaccinate patients diagnosed with COPD (parainfluenza and pneumococcal) to help prevent acute exacerbations.
3. Use the correct empiric antibiotics according to the global protocols in managing an acute exacerbation.
4. Look for alpha-1-antitrypsin deficiency in patients whom are suspected to have it.

5. Wear the appropriate face masks in people whom are in recurrent intact with chemicals and biomass fuels.
6. Routine check up for patients diagnosed with COPD since the first time diagnosis.
7. Encourage patients to change their lifestyle and exercise routinely due to the high percentage of cardiac reasons of mortality.

Compliance with Ethical Standards

- Funding**:** This study was not funded by any institution.
- Conflict of Interest: The authors of this study have no conflict of interests regarding the publication of this article

Ethical approval

The names and personal details of the participants were blinded to ensure privacy.

ACKNOWLEDGMENTS

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