

Histo-Pathological Study of Lungs in Cases of Hospitalised Deaths: An Autopsy Based Study

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Abstract:

Lung pathology is one amongst the major causes in cases of unnatural deaths, which are seen at routine autopsy. Disease of the lungs amounts to one third of all the hospitalised deaths. This study was conducted at Department of Forensic Medicine and Toxicology in Bangalore Medical College and Research Institute, Bangalore to know the histo-pathological changes in the lungs of deceased died at Hospitals while getting treatment following any unnatural and natural causes. Though the primary cause of death was different, the autopsy based prospective study was undertaken to know lung pathologies like pulmonary oedema, pulmonary embolism, **Acute Respiratory Distress Syndrome (ARDS)**, Pulmonary haemorrhage and other lung pathologies among 100 cases which were hospitalised for at least 3 or more days and died due to various reasons during hospital stay. The study revealed that the lung pathologies play very significant role in causation of death in hospitalized cases and highest being the pulmonary oedema followed by ARDS and least being the chronic venous congestion.

Keywords: ARDS, Autopsy, pulmonary congestion, oedema, pulmonary embolism

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Introduction:

The autopsy, the oldest method of medical investigation, has been placed in a peculiar position. To some it is now an unnecessary procedure, one that has been superseded in importance by newer methods of study, biochemistry, cardiac catheterization, angiography and isotope scanning, to mention a few.¹ Autopsy practice continues to change and evolve.² The autopsy remains one of the most reliable methods to validate clinical diagnoses.³ It may reveal diagnosis which may not be suspected clinically or may, in some way, discredit. In addition to ascertain clinic-pathological differences, the development of new understanding of old diseases and provision of opportunity to discover new disease should be emphasized.

The lungs are involved in various kinds of inflammatory, neoplastic and other lesions, but they are secondarily involved in almost all from of terminal diseases.⁴

The study of lung pathology in deaths due to various causes (RTA, burns, poisoning, fall and for other causes like surgery following injury to hip, pelvic and spine), especially if a person is hospitalised for more than 3days will help the medico legal expert in deciding the cause of death and also the clinician in treating a medico legal case. Hence in the present study, we sent lung specimens to department of Pathology for histo-pathological examination to correlate the cause of death with histo-pathological findings.

Objectives:

To determine the Gross and Histopathological findings in autopsied lungs and to correlate it with the cause of death.

Materials and Methods:

The present study has been carried out in the Department of Forensic Medicine and

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Toxicology and Department of Pathology, Victoria Hospital attached to Bangalore Medical College and Research Institute, Bangalore during the period November 2013 to August 2015. A sum of 100 cases of deaths for various reasons following burns, poisoning, fall from height, road traffic accidents and other causes which were hospitalised for at least 3 or more days and died were considered for the study. The age limit in this study was of above 15 years because deaths in children below 15 years are more due to acute respiratory causes. Both Males and females were included in the study. Bodies which were decomposed and dead bodies with known cases of pre-existing lung diseases were not included in the study.

Results:

During this study period a total of 100 cases of various causes of death like RTA, trauma (h/o fall, assault), burns, poisoning, surgery following injury to hip, pelvic and spine and other causes, admitted for at least 3 or more days at Victoria Hospital or other hospitals were considered. All cases were registered as medico-legal cases and informed to police as per section 39CrPC. The majority of the cases in our study population were in the age group of 26-35 years. The least were in the age group of more than 46 years (Table no.1). Numbers of males in this study were 51 and while females were 49 (Table no.2). In this study of 100 cases, it was observed that in the histo-pathological examination reports obtained after the microscopic examination of the lungs of the deceased who were hospitalised for three or more days for the treatment of various medical conditions, the pulmonary oedema was present in 39 cases (39%), pulmonary congestion in 15 cases (15%), ARDS in 10 cases (10%), pneumonia in 9 cases (9%), tuberculosis in 8 cases (8%), emphysematous changes in 5 cases (5%), Chronic Venous Congestion of Lungs in cases (4%), pulmonary haemorrhage in 4 cases (4%) and normal lungs or no histo pathological abnormality was seen in cases- (2%).

Table 1: Distribution of Study Population based on Age.

Age Group	Frequency
16 to 25 Years	28
26 to 35 Years	34
36 to 45 Years	30
>46 Years	08
Total	100

Table 2: Distribution of Study Population based on Gender

Gender	Frequency
Male	51
Female	49
Total	100

Table 3: Correlation of Histo-pathological results with gender in study population

Histopathological Results	Total
ARDS	10
Congestion	15
CVC	4
Embolism	4
Emphysema	5
Haemorrhage	4
Normal study	2
Oedema	39
Pneumonia	9
Tuberculosis	8
Total	100

Discussion:

Acquired lung diseases during hospital stay is becoming quite common nowadays. During Autopsy, we have come across deaths due to pulmonary embolism, hospital acquired pneumonia, acute respiratory distress syndrome, acute pulmonary edema, fat embolism, primary hypertension, chest infections due to lack of physiotherapy etc, especially in cases who have been admitted and are immobile due to road traffic accidents, trauma, burns, poisoning, surgery following injury to spine, pelvis, hip and lower limbs.

Pulmonary embolism is the third most common cause of death in hospitalized patients and the most under diagnosed cause of death where no autopsy is performed. Many studies have shown that approximately 60% of the patients who have died in hospital had pulmonary embolism.^{5, 6}

Hence, an autopsy based prospective study of lung pathology in hospitalized patients died due to various reasons, was taken up to know up to know the present scenario. Our study included 100 cases of deaths for various reasons following burns, poisoning, fall from height, road traffic accidents and other causes, which were hospitalised for at least 3 or more days and died.

In our study, out of 100 cases who were hospitalized, 49 cases were of burns. In these burns cases, the histo-pathological results were as follows-oedema in 24 cases, pneumonia in 3 cases, ARDS in 5 cases, congestion in 8 cases. In a previous study conducted by Bala S, out of total 126 cases, oedema was seen in 20 cases, ARDS in 20, pneumonia in 4, congestion 60 cases. The percentage of ARDS in our study w.r.t. burns was 10.2, while in their study it was 15.87. Pulmonary edema was seen in 48.9% of the burns cases in our study whereas in the study done by Bala S it was 32%. This difference was observed because in our study the minimum number of days hospitalized was 3 or more whereas they did not have any such criteria for days hospitalized.⁷

In this present study, the total number of pulmonary embolism cases were 4%, while in a study conducted by Kopcke D, Pulmonary embolism was seen in 2% of cases⁸ and a study conducted by Dismuke SE, et al.- the number of cases of pulmonary embolism were 6%⁹. The proportion of death caused by pulmonary embolism appears to be considerably lower than the widely published rate. There is little scope for further reduction of pulmonary embolism mortality through use of caval filters according to guidelines.^{8,9}

Conclusion:

Though in all the medico-legal cases which are subjected to autopsy, injuries may or may not be present. In such a scenario, the injured may be hospitalised. Amongst hospitalised patients' deaths are encountered which may or not be directly related to the primary causes. Death due to lung pathology has significance. In this study of 100 cases, where the deceased was hospitalised for more than 3 or more days, lung pathologies like

pulmonary edema, ARDS, pneumonia, emphysema, pulmonary haemorrhage, embolism CVC lung and congestion were noted.

Conflict of Interest: None to declare

Ethical clearance: Obtained from institutional ethics committee

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