

HISTOLOGICAL FEATURES OF PNEUMONIA IN SOME LABORATORY ANIMALS: A SUBJECT REVIEW

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ABSTRACT

The animals model of pneumonia assist us to observe the distinct types of pneumonia in a variety disease stages, when the study that aren't possible in patients, especially the respiratory infections constitute a major problem, besides to breeders than for veterinarians, because of a majority in economic losses that causes, and the expense of caring and prevention. The lung is the most exposed organs to various aggression agents as a result to their anatomical and histological properties; therefore, the deterioration of the hygienic conditions is the important factor that promote respiratory diseases, particularly when the lower parts of respiratory system inflammation were amongst the leading etiology of mortality and morbidity globally.

INTRODUCTION

Pneumonia defines as either acute or chronic inflammation of the pulmonary tissue characterized by disturbed in respiration and hypoxemia and accompanied by systemic disorders of associated toxins. The most common causes are the primary viral infection of the lower tract. For many, the animals model of infections were used in many biomedical researches for

accelerate progresses in many field like cancers, neurosciences, infectious disease and drugs development.

The aims of develop the animals model in pneumonic cases are to illustrate the pathophysiology as well as phenotype characteristic in humankind to control the setting status; which it gave a vision of the infections particularly to comorbidity and antibiotics uses.

The study of the animal's model also had advantage included circumvent sampling limitations issue that were commonly encounter with humans subject. The précised control over time of the infectious challenges in the animals model may allowed for a more understand of the temporal evolutions of the diseases and developments of complication that were mostly related to altered immunological and inflammatory responses in the host.

The partial induction of the animals model of pneumonia were always designed into purpose of studied particular phenotypic features of the diseases besides the lack other clinical symptoms or etiologies. Moreover, the animals model of the pneumonia, particularly the rodents pneumonia model, had aid considered in the understand of the diseases mechanisms and it utilities in pre-clinical pharmaceutical testing.

The human and the rodent considered the variation between the rodent and the human composed the immune system, especially, the murine had few neutrophils that circulated when it compared to humans, it had a different Toll like receptors (TLRs) expressions specify in the cells subsets, that responded in a different ways toward a specific chemotactic.

The IL-10 have a specific T helper – 2 (Th2) anti-inflammatories functions in rodent, while in the human, the T helper-1 (Th1) and T helper-2 (Th2) cells secreted IL-10 which served the immunomodulatory cytokines.

Moreover, the activated and proliferative Th17 cells, a T-cell subsets that have an importance in the defenses against Gram negative bacteria causing pneumonia was induced by interleukine-1 beta (IL-1 β), interleukine-6 (IL-6), and interleukine-23 (IL-23) in human comparing to interleukine-6 (IL-6) and transforming growth factor- beta (TGF- β) that were the common driver of interleukine-17 (Th-17) differentiations in murine, that noted a variation which influenced experimentally outcome. For instance, the balb-c mouse classified as Th-2 responders strains when matched to a C₃H/HeN mouse that regarded Th-1 responder, which established infections by using particular bacterial doses lead to high mortalities in Th-2 responded strains.

Inherits difference among rodents and humans had mostly contribute to high numbers of failure observed in the human clinical trials. Moreover, the adult when immune-competent humanized HAP animal's model that mimics host cytokines responses may generated the data and mechanisms with more translation values in the direct investigation mostly clinical relevant infectious processes of human pneumonia. In addition, the potential majority of the advantage of utilized a humanized immunity in order to check the microbial pneumonias; the common used animals model was a wild type, which mentioned earlier was simply to creates and allowed for most flexibilities in experimental steps so that it remained a famous tools to ensure the problem surrounded acquired pneumonia.

The respiratory disorders in rats and mice may presence in nonspecific sign, which was, not differentiate from other organs system disease, due to a higher metabolic rate, ill rodent deteriorated acutely and must examined for example:

1. The ill rat and mouse do not groom as normal, lead to a rough coat.
2. They are lethargic and often separated in the cage mates.
3. The nasal discharge infrequently noted in mice, while it seen some respiratory status in rats.
4. Excessive respiratory secretion may be heard as evidence of breathes.
5. The respiratory efforts change but difficult to distinguish because of the rapid respiration.

alveolar walls occasionally have intra-alveolar macrophages and neutrophils characterized the normal lung; the per bronchial space may appeared expanded. It should not confused with peri-bronchial edema.

The intra-tracheal intubation of injured substances was associated with patchy lesions. In addition, some type of injuries were associated with neutrophils infiltration as well as proteinaceous debris or fibrins deposition in the airspace.

Other types of injury associated with thickened alveolar wall, which composed neutrophils but no protein deposition. Moreover, hyaline membranes appear as pink deposition in alveolar walls stained with H and E.

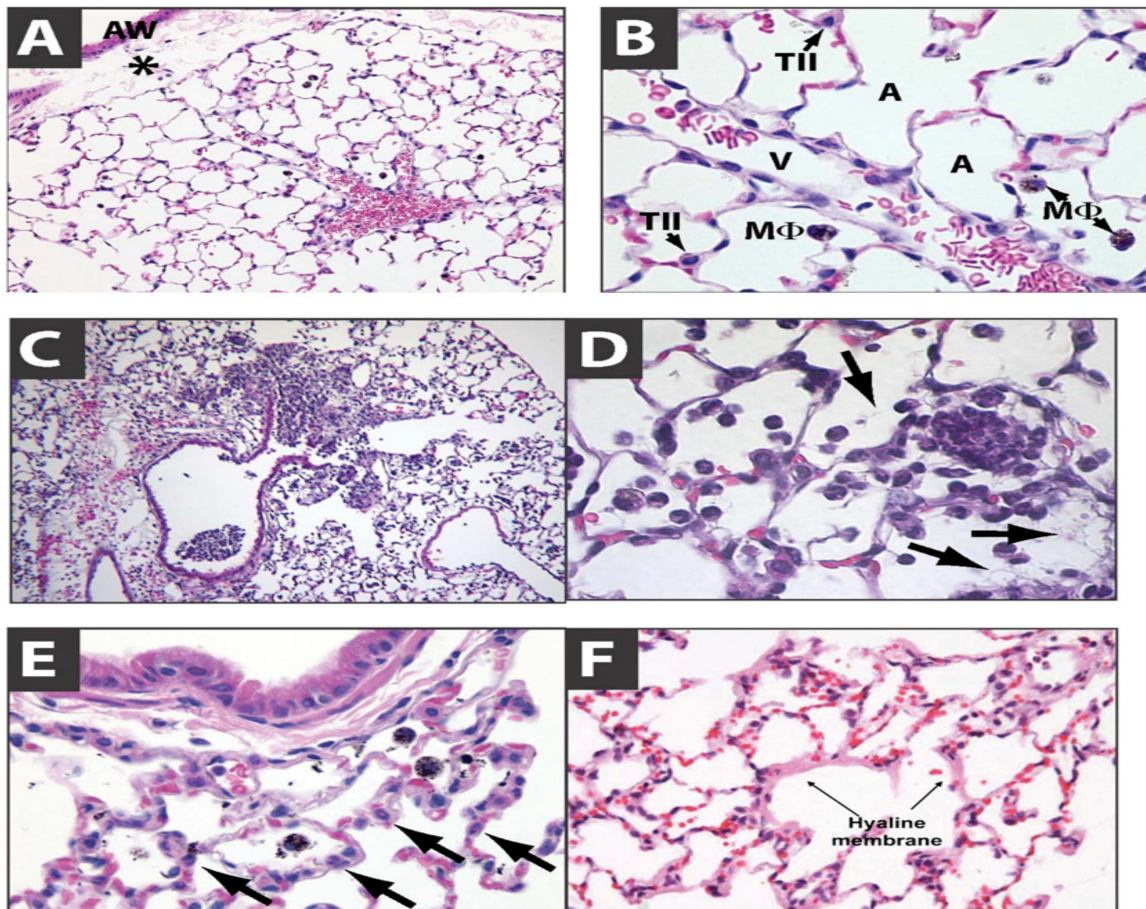


Figure 1. Lungs it were a normal and injured. (A, B) Normal mice lung, the alveolar wall were thin and alveoli contained occasional alveolar macrophages. In addition to art factual expansions of the peri-bronchial tissues, which commonly resulted from tissues processing, does not had edema. A referred to airspace; V, was blood vessels; TII, was type-II cells; M, was alveolar macrophages; AW, was airways. (C & D) shows a neutrophilics infiltrate with fibrins deposition (arrows of D). alveolar wall was thin. (E) Thickened wall with neutrophils (arrows). Absence of neutrophils. The black substances inside the macrophages was colloidal carbon. (F) Hyaline deposition (arrows). (Figure cited from Gustavo Matute-Bello, et al., 2011).

The present of increased neutrophils number in the bronchial associated lymphoid (BAL) fluids was unlikely associated with obvious intra-alveolar neutrophils infiltrate, as a result of the BAL procedures that accumulated a neutrophils via entire lung, moreover, the neutrophils appeared a light stain; for example, in the rabbits the neutrophils were appeared esinophilic and didn't strict a neutrophils in the cell that didn't stain.

الصفات النسيجية لذات الرئة في بعض الحيوانات المختبرية: مراجعة

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الخلاصة

تتيح نماذج الالتهاب الرئوي في الحيوانات المختبرية بالتحقيق في أنواع مختلفة من مراحل ذات الرئة الغير ممكن دراستها في الانسان وخاصتا بعض امراض الجهاز التنفسي التي تؤدي الى مشاكل خطيرة ومهمة، اضافة الى أهميتها البيطرية وكذلك للمربين بسبب الخسائر الاقتصادية الكبيرة التي تسببها ونفقات الرعاية والوقاية التي تنتج عن تلك الامراض الخطيرة. الرئة هي أكثر الأعضاء تعرضا لعوامل الأمراض المختلفة نتيجتا لخصائصها التشريحية والنسجية لذلك فان تدني الظروف الصحية هو العامل الأبرز الذي يعزز امراض الجهاز التنفسي ولاسيما عندما تكون التهابات الجهاز التنفسي السفلي من بين الأسباب الرئيسية للوفيات والامراضية على مستوى العلم.

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