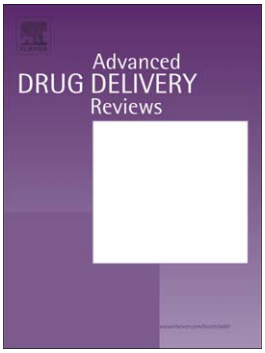

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Animal Models of Smoke Inhalation Injury and Related Acute and Chronic Lung Diseases

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Abstract

Smoke inhalation injury leads to various acute and chronic lung diseases and thus is the dominant cause of fire-related fatalities. In a search for an effective treatment and validation of therapies different classes of animal models have been developed, which include both small and large animals. These models have advanced our understanding of the mechanism of smoke inhalation injury, enabling a better understanding of pathogenesis and pathophysiology and development of new therapies. However, none of the animal models fully mirrors human lungs and their pathologies. All animal models have their limitations in replicating complex clinical conditions associated with smoke inhalation injury in humans. Therefore, for a correct interpretation of the results and to avoid bias, a precise understanding of similarities and differences of lungs between different animal species and humans is critical. We have reviewed and presented comprehensive comparison of different animal models and their clinical relevance. We presented an overview of methods utilized to induce smoke inhalation injuries, airway micro-/ macrostructure, advantages and disadvantages of the most commonly used small and large animal models.

Keywords: smoke inhalation, lung injury models, small animals, large animals