INTRODUCTION

Fat Embolism (FE) induced in rats by IV injection of Triolein (T) results in pulmonary vasculitis, inflammation, and fibrosis(1). Captopril and losartan, two drugs acting on the renin-angiotensin system, prevent this damage(2). Administration of the renin inhibitor, aliskiren also ameliorates the lung’s histopathological changes induced by T injections with findings present as early as 48 hours after injection(3). Aliskiren also reduced the number of mast cells observed after T injection(4). This study is aimed at assessing aliskiren’s effect on both the presence of vasculitis and on the number of renin/prorenin stained cells in a rat model of FE.

METHODS

Sprague-Dawley rats (250-300g) were treated with 0.2 ml IV of T(n=18) or saline (n=4). One hour later the rats were divided into with injections with 0.2 ml of saline, 50 mg/kg, and 100 mg/kg of aliskiren(n 6 per group). 48 hours later all subjects were necropsied after isoflurane anesthesia, lungs removed and fixed in 10% formalin with sections submitted for H & E, Trichrome, and Abscam specific antibodies for renin/prorenin cells(R/P). Two pathologists unaware of the slide identity took 10 photographs randomly at 400x and counted the number of R/P stained cells.

RESULTS

- Figure 1: Renin stained cells

  • Sections demonstrated lung arterial vasculitis, septal inflammation, and fibrosis, which were already evident after 48 hours.
  • Renin/Prorenin stained cells were present in all groups and mostly located in the arterial adventitia, the thickened septa and subpleural.

- Figure 2: Representative samples of renin stained lung sections of the four groups.
  
  (A) Control  (B)T+Saline  (C) T+50 mg aliskiren (D)T+ 100 mg aliskiren. Stain: Abscam R/P at 400x.

- R/P immunointense reactivity was observed in cells of different sizes and shapes; with some having small oval stained cytoplasm and nucleus, while others demonstrated larger cytoplasm and nucleus with less intense stain and diffuse cytoplasmic vacuoles.

- A significant increase was seen for T-saline group vs the controls (p=0.008) for the small cells, but not for the larger ones. The 50 mg dose of aliskiren did not reduce either cell numbers while the 100 mg dose however induced a marked reduction vs the T-saline cells for both small and large cells (p=0.007). The ratio of small vs large cells was approximately 75% vs 25% for all groups.

CONCLUSION

- The increase in R/P stained cells after FE may be related to a persistence of pulmonary mast cells population as seen in other pathological conditions and underlines the RAS involvement in FE. Different doses of aliskiren may have a different response in those cells presence.

Credits/Disclosures/References


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