

Connective tissue lung: different composition between male and female

Giuseppina Rizzo¹, Maurizio Monaco², Giuseppe Santoro¹, Giuseppe Anastasi¹

¹ Dipartimento di Scienze Biomediche e delle Immagini Morfologiche e Funzionali, Università degli Studi di Messina

² Dipartimento di Scienze Sperimentali Medico-Chirurgiche, Specialistiche ed Odontostomatologiche, Università degli Studi di Messina

Abnormal elasticity of lung tissue has a major impact on the clinical progression and outcome of many lung diseases including respiratory distress syndrome, asthma, emphysema and pneumothorax post thoracic injury. The major components of lung connective tissue are elastin, collagen and together provide the lung with its elasticity and tensile strength. Elastin is composed of flexible cross-linked polypeptides and has a linear stress-strain relation up to 200% strain; collagen has a more organized structure with both crystalline and amorphous phases and exhibits a highly unlinear stress-strain curve. The thoracic injury is responsible for about 25% of death for injury and in particular it represent 12% of all death in man in comparison to 7% of death in female. This different in death rate is due to the different hormone levels between man and female. On the other hand female sex hormones, estrogens (*e.g.* 17 β -estradiol) exert important biological actions, both protective and undesirable. In particular in addition to their primary function as reproductive hormones, estrogens (*e.g.* 17 β -estradiol) influence a wide range of other physiological processes in humans and other mammals, including cardiovascular, respiratory, and neuronal function, and bone density. With special respect to the cardiorespiratory system, estrogens promote lung development and differentiation and exhibit pulmonary and cardiovascular protective properties. However, very little is known about the different composition of the two major constituents of the connective tissue of the female and men lung. We have studied by CLSM the elastin and collagen in man and female lung. All proteins tested are present in lung tissue of male and female and they are localized in the peribronchiolar and in the interalveolar septum. The reaction to elastin shows very differences staining in the basal laminae of small and medium bronchioles in two sexes, in particular these structures stained very strongly in female but not in male. Opposite behavior we have showed to collagen type IV reactions. In male the collagen type IV is localized as a continuous network throughout the lung parenchymal tissue and in the basal laminae it shows strongly staining.

References

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