

KSN 2017 Abstract

KSN-17-P214

The effects of periostin on the aging process

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Objectives : Periostin, a matricellular protein, has been reported in diverse processes and pathologies in tissue remodeling through the promotion of adhesion, cell survival, cellular dedifferentiation, and fibrogenesis. However, its role in aging process is unknown.

Methods : We investigated expressions of periostin in normal human kidney tissues classified by age (20, 40, and 60 years) and in mice kidney tissues of wild type (WT) C57BL/6 mice or Postn null (Postn^{-/-}) mice aged 24 months. In addition, chemistry data including serum creatinine and histopathology findings of WT mice or Postn null mice classified by age (young vs. aged; 2-months old vs. 24-months old) were examined.

Results : Periostin expressions in normal human kidney tissues were significantly different according to the age. Intrarenal periostin expressions were prominent in the patients aged 60 years compared to those aged 20 years. In vivo, the gross appearance and the kidneys of aged WT mice were bigger and heavier than young WT mice. Serum creatinine levels were also higher in the aged WT mice compared to those in the young WT mice. However, all these changes were diminished in the aged Postn null mice; serum creatinine levels were considerably lower in aged Postn null mice than in aged WT mice. Apparent tubular atrophic changes, interstitial fibrosis, and collagen fiber deposition which were prominent in the aged WT mice than in the young WT mice, were remarkably alleviated in aged Postn null mice. Furthermore, the expressions of periostin were also attenuated in aged Postn null mice compared to in aged WT mice.

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Conclusions : Aging resulted in morphologic/physiologic changes and increased expressions of periostin. Periostin ablation could have protective effects in aging process.

Keywords : Periostin; Aging