353

Chen B[1], Wen Y[1], Polan M L[1]
1. Stanford University School of Medicine

ELASTIN DEGRADATION IN WOMEN WITH STRESS URINARY INCONTINENCE COMPARED TO CONTINENT CONTROLS

Aims of Study

Weakening of pelvic supportive tissues is thought to be a contributing etiology in female pelvic floor disorders such as stress urinary incontinence (SUI). Since elastin modulates the mechanical properties of pelvic supportive tissues, we hypothesize that elastin degradation is increased in women with SUI compared to asymptomatic controls. Proteolytic enzymes capable of degrading elastin fall into three groups: serine proteases, cysteine proteases and matrix metalloproteinases. We investigated overall elastase activity, human neutrophil elastase (a serine protease), cathepsin K (a cysteine protease), and alpha-1 antitrypsin (a serine protease inhibitor) mRNA expression and protein levels in vaginal tissues from women with SUI compared to continent, controls.

Methods

Full-thickness peri-urethral vaginal wall tissues were collected from age and menstrual-phase matched SUI and continent, control women at the time of pelvic surgery. Elastolytic activity in the homogenized tissue was determined by the generation of amino groups from succinylated elastin. To quantify mRNA expression and protein levels of each enzyme, quantitative competitive, reverse transcription PCR and confirmatory Western blot analyses were performed on the samples for human neutrophil elastase, cathepsin K and alpha-1 antitrypsin.

Results

Vaginal wall tissue samples were obtained from 12 premenopausal women with SUI and 15 premenopausal continent control women. All participants were in the proliferative phase of the menstrual cycle. The two groups were similar in age and body mass index, but differed with respect to parity, with higher parity seen in the SUI group. The mean elastolytic activity in vaginal tissues from the SUI group was similar to that in the control group. With respect to the proteolytic enzymes, neither human neutrophil elastase nor cathepsin K differed between the two groups. However, both alpha-1 antitrypsin mRNA expression and protein levels were significantly decreased in tissues from the incontinent women (Figures 1 and 2).

Figure 1.

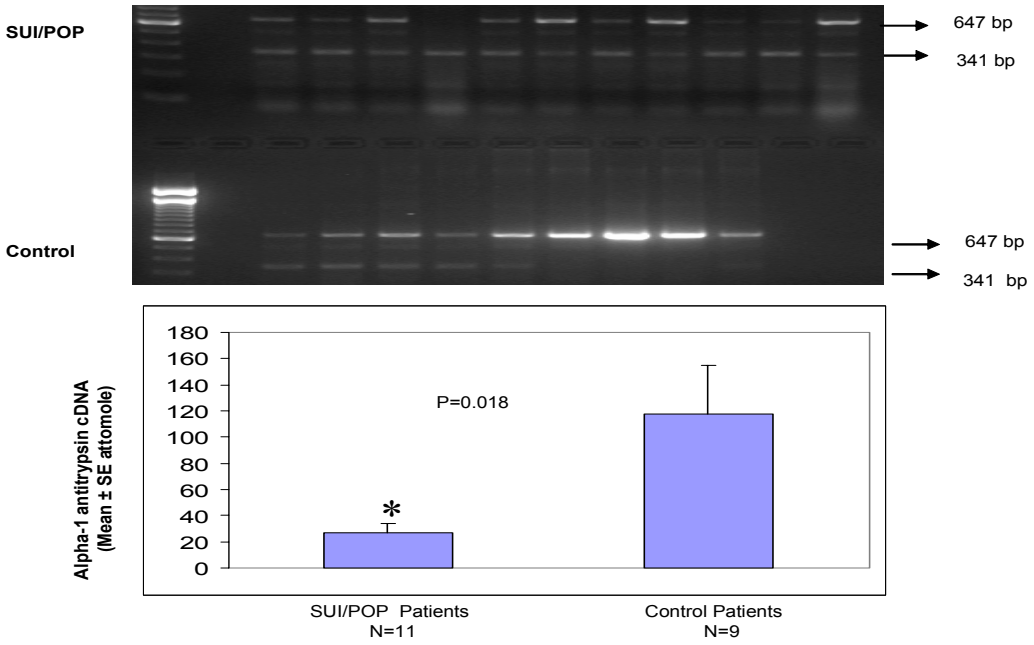
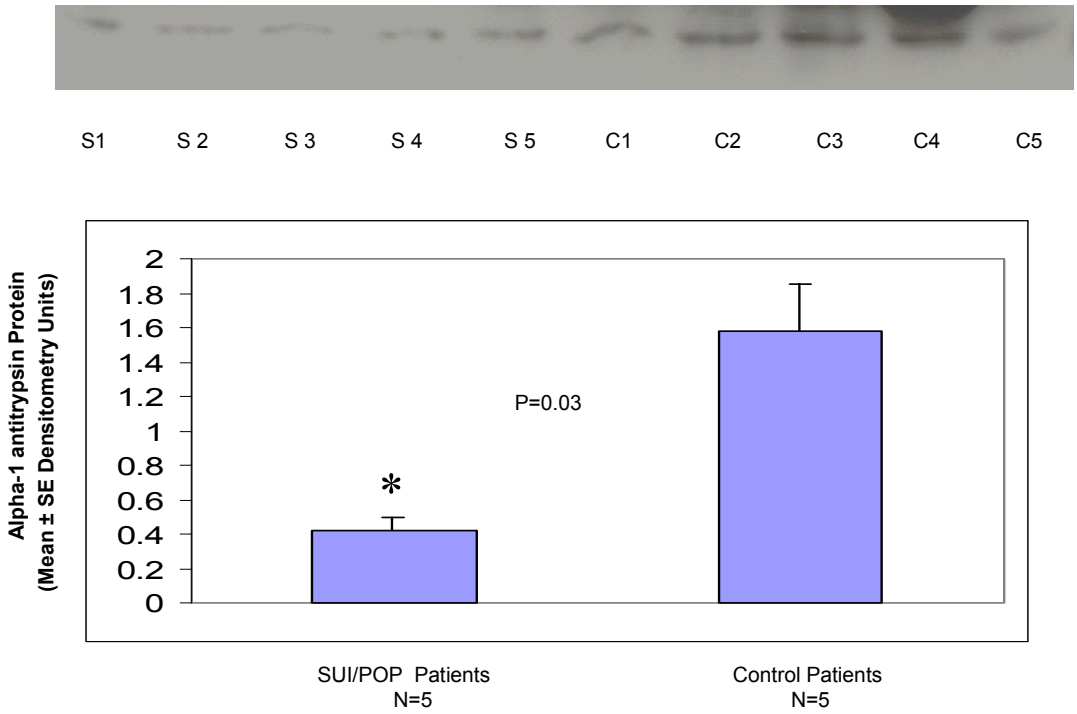


Figure 2.



Conclusions

Our data suggest that premenopausal women with stress urinary incontinence demonstrate loss of inhibition on baseline elastin degradation by expressing significantly lower levels of alpha-1 antitrypsin in their pelvic tissues compared to asymptomatic control women. This is consistent with the chronic nature of this disorder.