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Title (type in
CAPITAL
LETTERS)**APOPTOSIS OF RHABDOSPHINCTER CELLS: THE MAIN CAUSE
OF URINARY INCONTINENCE WITH ADVANCING AGE?**

Aims of Study: Urinary incontinence poses a major problem for the elderly. It has been shown that bladder capacity and the ability to postpone voiding as well as maximum urethral closure pressure and length decline with advancing age. The exact morphologic and functional changes of the sphincter mechanism have not been known so far. Therefore, we examined apoptosis and cell densities of the urethra and the striated rhabdosphincter in different age groups to quantify the changes of both structures during life.

Methods: Tissue specimens were obtained from 23 cadavers (age 5 weeks to 92 years; 16 men, 7 women). The tissue was fixed in buffered formalin; histological sections were taken from 3 different levels of the rhabdosphincter. The TUNEL method was used to detect apoptosis in the urethra and the rhabdosphincter. Morphometric evaluations were done on a magnification level of 400x and 40x. The relative volume densities of the striated muscle fibers and the urethra, the diameter of the rhabdosphincter and the diameter of the urethra were determined in all specimens.

Results: We found an age dependent increase of apoptosis in the striated muscle fibers of the rhabdosphincter, leading to a dramatic decrease of the number of striated muscle cells. Whereas the striated rhabdosphincter cells contribute 87.6% of the tissue of the muscle in the 5 week old infant, this number decreases to 34.7% in the 92 year old woman. There is a direct linear correlation between the age of the investigated specimens and the decrease of volume densities of the striated muscle cells.

Conclusions: In older men and women the amount of striated muscle cells decreases distinctly, a process which is due to apoptosis. We believe that these changes represent the morphological basis for the high incidence of urinary stress incontinence in older people.