

with an increase in alpha-adrenergic activity and ARB may decrease bladder outlet resistance, thereby facilitating normal micturition. SIC may be considered as a modality of TWOC for the pts with first episode of spontaneous AUR due to BPH, especially for the pts with relatively small amount of retention volume. In the second part of the study, pts with initially successful TWOC were more likely to have recurrent AUR if their post-TWOC volume was high. Finally, perhaps it is the time to use SIC and ARB as a first-line approach.

## S24

### Risk factors for BPH progression in population of men aged 50 to 80 years

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**Introduction and Objectives:** BPH is progressive disease, and risk factors for disease progression are well established. In Serbia, compared to other diseases with known risk factors such as Diabetes Mellitus, coronary artery disease or cerebrovascular disease, there is a considerable lack of strategy for prevention of BPH progression. Aim was to determine the risk factors for BPH progression in two groups of men.

**Material and Methods:** Investigational group of 102 men who complained on LUTS at first visit to urologist, and control group of 109 men who did not complain on LUTS, but came to urologist because of other reason, consisted study group of patients in a survey of LUTS in men aged between 50 to 80 years. Prostate volume and post void residual urine were measured by transabdominal ultrasonography, and PSA was performed for every patient. Uroflowmetry was performed only in selected patients in investigational group.

**Results:** We found higher PSA values ( $X^2$ ,  $p < 0.05$ ) and higher prostate volume ( $X^2$ ,  $p < 0.05$ ) in investigational group. In investigational group 53% and in control group 30% of patients had PSA  $> 1.5$  ng/ml. Prostate volume above 30 ml was found in 55% of patients in investigational, and in 33% of patients in control group. In average patients in investigational group were older than controls. PVR  $> 100$  ml was found only in investigational group. Patients with  $Q_{max} > 15$  ml/sec had lower PSA, prostate volume and PVR compared with patients with  $Q_{max} < 10$  ml/s. Increasing PSA values with increasing prostate volume as well as increasing PSA values and increasing prostate volume with increasing age were noticed in both groups, but correlation was not statistically analysed because two groups were not age matched due to the study design characteristics.

**Conclusions:** In attempt to analyze a portion of patients in typical urologists' office in Serbia, we found that in half of patients who did seek help because of LUTS, and in 1/3 of patients who did not, risk factors for BPH progression were found. This fact emphasizes the significance of comprehensive approach in LUTS patient, bringing them up information's about disease and existing treatment modalities

## S25

### Volumetry of prostate gland from TRUS images: An automatic method

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**Introduction and Objectives:** Accurate prostate gland volumetry with minimal deviation is essential to define the appropriate surgical technique for prostate removal as well as to define the proper radioactive isodose for prostatic cancer. The proposed method is fully automatic.

**Material and Methods:** Our method uses 20 TR.US images in transverse section with approximately 2 mm distance. An algorithm is applied to process the high speckle images using proper filtering techniques such as the histogram thresholding, the median filter, the stick filter and the regional contrast enhancement. Using the deformable contour model the prostate edges are depicted from each image. A simple algorithm is applied to compute the horizontal and vertical dimensions in pixels in both (x) and (y) axes, exports them in millimeters, and then the volume of each section is estimated. The process is repeated for the next image until the whole gland volume is measured.

**Results:** The proposed method obtained excellent results as compared to the volumetry of the gland from radical prostatectomy specimens (deviation 8.27% in average) or to MRI volumetry (deviation 11.3% in average).

**Conclusions:** The proposed algorithm requires no user interaction, provides excellent volumetric results and can be applied to several diagnostic and therapeutic models. The obtained results can be embedded in a database or in patient's health record in order to have future references for treatment response as well as for other uses.

## S26

### Prostate contour extraction from TRUS images and 3D model reconstruction: An automatic method

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**Introduction and Objectives:** 3D prostate gland depiction from Transrectal Ultrasound images assists the clinician in several situations such as accurate gland volumetry, tumor margin estimation, PSA density calculation, 3D visualization, Brachytherapy, HIFU, Cryosurgery etc.

**Material and Methods:** Our method involves preprocessing (edge preservation, noise reduction, smoothing) and prostate gland segmentation. The proposed algorithm uses the deformable model (snake), a method that involves designing an energy function and then optimizing this function. The initial contour or the seed points were estimated automatically from the image with the highest diameter both in transversal and sagittal plane. Special measures were taken to deal the high speckle noises and complex shapes of prostate boundaries. In general a series of imaging enhancement methods were used such as histogram thresholding, median filter, stick's filter and regional contrast enhancement. The 2D contour was extracted from approximately 20 2D images, which were processed with the help of an image editor in order to reconstruct the 3D of the prostate gland.

**Results:** The proposed method obtained excellent gland segmentation result with average overlapping areas of 91%, as it was compared with expert radiologist's segmented images. It is possible to segment the gland from the interior and to identify tumourous lesions.

**Conclusions:** The proposed algorithm requires no user interaction, provides excellent segmentation results and can be applied to several diagnostic and therapeutic modes.