

S21**Detection of TMPRSS2-ERG fusion gene in benign prostate hyperplasia**

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Introduction and Objectives: Recent studies have reported that a high proportion of prostate cancers express fusion genes. These fusion genes occur when the 5' region of an androgen regulated gene (mainly TMPRSS2) merges with one gene of the ETS family transcription factors. TMPRSS2-ERG is the most frequently detected fusion gene (50–70% in PCa). This fusion gene was also detected in 20% of HGPIN and 7% of BPH samples. The aim of this study was to investigate further the presence of this fusion gene in prostatic benign hyperplasia samples.

Material and Methods: FISH analysis was applied in a number of BPH samples, derived from TURPS. Two BAC clones (RP11-137J13 and RP11-24A11), were directly labeled by nick translation with Spectrum Green and Spectrum Texas Red respectively (Vysis). Probe labeling and FISH were performed using Vysis reagents according to manufacturers' protocols. Visualization and analysis of the hybridization results was obtained with an Axioplan Imaging fluorescence microscope (Zeiss, Germany) with appropriate filters and MetaSystems ISIS FISH imaging software (MetaSystems).

Results: Herein, 24 BPH have been analyzed so far. Four of the 24 BPH samples were tested positive – by FISH – for TMPRSS/ERG fusion.

Conclusions: TMPRSS2: ETS fusion genes can be detected by FISH analysis in a proportion of benign prostatic hyperplasias. The detection of this fusion gene in BPH supports the hypothesis that this fusion may arise early in the prostate cancer development. The detection of fusion genes in BPH addresses the need of further studies to support the clinical use of these genes as diagnostic and prognostic marker in prostate cancer.

S22**Serenoa repens. What is the price of the lowering of the IPSS for one point with this herbal extract?**

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Introduction and Objectives: The lipidosterolic extract of *Serenoa repens* (LESR) is the most commonly used herbal preparation in the management of lower urinary tract symptoms (LUTS) associated with benign prostatic hyperplasia (BPH). Precise mechanisms of action, clinical benefit and pharmacoeconomic aspect of the treatment are still controversial. Objective: To evaluate the cost/effectiveness of LESR in the management of LUTS associated with BPH.

Material and Methods: This was an open-label, prospective clinical study which included 30 patients with mild/moderate uncomplicated symptomatic BPH (mean baseline IPSS = 12.30), aged 45–73 years who complied inclusion criteria. Patients have received LESR (320 mg/day) for three months. All patients filled the IPSS questionnaire before and after medication. In order to evaluate the cost/effectiveness of LESR, we used internationally

accepted pharmacoepidemiologic/pharmacoeconomic methodology with defined daily dose (DDD) as a measuring unit. DDD of LESR is 320 mg and ATC code is G04CX02. After three months, we calculated both total consumption and cost of LESR in DDDs and EUROS and total IPSS reduction in questionnaire. Patients who reported adverse reactions to drug were excluded.

Results: Twenty-two patients (73.33%) came to final assessment and filled the IPSS questionnaire. During 3 months, patients received 1980 DDDs of LESR. The price of one DDD was approximately 0.35 EUR, so the price of whole treatment was 693.00 EUR. Average values of the IPSS after 3 months were significantly reduced compared to baseline values (12.30+4.52/6.25+4.72)(p<0.01). At the same time, total reduction of the IPSS was 109 points. So, the price of the lowering of the IPSS for one point with this herbal brand was 6.36 EUR.

Conclusions: This study could be a model more for the pharmacoeconomic evaluation of one aspect of the BPH management, such as LUTS. Similar methodology could be applied on other aspects of BPH, including reduction of prostate volume, improvement in urinary flow, improvement of quality of life, prevention of complications and so on.

S23**Acute urinary retention due to Benign Prostatic Hyperplasia and single intermittent catheterisation**

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Introduction and Objectives: Acute urinary retention (AUR), remain an important health issue. AUR is complex and may present in various ways as results of a myriad of pathologic processes. Once AUR occurs, delay of surgery when possible must be the aim to reduce the risk of perioperative morbidity and mortality as well as to allow the bladder to recover its contractility. Treatment of AUR requires urgent catheterisation. Trial without catheter (TWOC) after indwelling Foley catheter for several days is widely accepted and recommended for the initial management of AUR. However, this management causes both physical and psychological stress and also increases urinary tract infections (UTI) rate. This study aimed to assess the effects of single intermittent catheterisation (SIC) as a modality of TWOC in patients (pts) with AUR due to benign prostatic hyperplasia (BPH) and also to access the determinant factors affecting success of TWOC.

Material and Methods: A total of 72 pts with first episode of spontaneous AUR due to BPH, where enrolled and analyzed in this randomized double-blind trial and were follow-up, at least 12 month. The subject were initially managed with SIC and received alpha adrenoceptor blocker (ARB) Omnic Ocas, during follow-up. The pts who had previous retention history, neurogenic bladder, urethral stricture, prostate cancer, pelvic operation and UTI sign were excluded. The success of TWOC was defined that the pts regained self voiding and free for AUR, at least one year. The possible parameters such as age, retention volume, prostate size, IPSS/QoL, PSA, serum kreatinine, diabetes mellitus and alcohol intake were analyzed and compared between success and failure group. Curve was drawn to assess adequate retention volume for TWOC with SIC.

Results: The success rate of TWOC with SIC was 48.6% (35pts). The amount of adequate retention volume of success group was significantly less than failure group. The multivariate analyses revealed that the only significant determinant factor related to success was urine retention volume (p<0.01). The maximal cut-off value of retention volume that preserved 100% of sensitivity was 500mL. With cut-off value of 750 mL, the success TOWC had a sensitivity of 76% and about 1000 mL had 18.3%, respectively.

Conclusions: AUR remains a significant burden for both the pts and health care service. AUR due to BPH may be associated

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.

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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

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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.

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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.