

## DOES CYTOKINE PROFILE MAY BE THE PROGNOSTIC FACTOR FOR POLYPROPYLENE MESH EROSION?

### Hypothesis / aims of study

Stress urinary incontinence and female pelvic organ prolapse are common disorders among postmenopausal women population. The lifetime risk for undergoing prolapse or continence surgery is one in 11 woman. Depending on surgical technique and used materials used - synthetic or biological - up to 30% of patients will require repeat prolapse surgery, and 10% will require repeat continence surgery [1]. Surgical management of these diseases using prosthetic materials is highly efficient but is associated with some risk of complications. One of them is mesh erosion. The application of synthetic meshes is associated with high cure rate but also a relatively high rate of erosion. The tissue response to prosthetic meshes depends on the operating field preparation, materials used, surgical technique and possibly patient's immunological and hormonal status [2]. The aim of the study was to assess if the cytokine profile may be the prognostic factor for polypropylene mesh erosion.

### Study design, materials and methods

From January 2002 to September 2005 in our Department 830 surgical procedures with polypropylene meshes were performed. Overall erosions rate was 4.5%. Serum concentrations of IL-2, IL-4, IL-5, IL-10, TNF- $\alpha$  and IFN- $\gamma$  were estimated in 300 randomly selected healthy patients. The blood samples were taken preoperatively and 1, 3, 6 and 12 months following surgery. The same immunological assessment was performed in each case of tape erosion. Concentration of six different Th1/Th2 cytokines were simultaneously determined in patients serum using Human Th1/Th2 Cytokine Cytometric Bead Array I kit (CBA I) (BD Bioscience Pharmingen, San Diego, CA, US). The test was performed according to the manufacturer's manual. In brief, 50  $\mu$ l of premixed capture beads were mixed with 50  $\mu$ l of the provided standards or serum and with 50  $\mu$ l PE-detection reagent. The mixture was incubated in the dark for 3 h at room temperature. After incubation the mixture was washed, centrifuged (at 200 x g for 5 min) and the pellet was resuspended in 300  $\mu$ l of wash buffer. The BD FACSCalibur flow cytometer (BD Bioscience Pharmingen, San Diego, CA, US) was calibrated with setup beads and 3000 events were acquired for each sample. Individual analyte concentrations were indicated by their fluorescence intensities (FL-2) and were computed by using the respective standard reference curve and BD CBA software (BD Bioscience Pharmingen, San Diego, CA, US). Serum samples were run without dilution. Concentrations of the samples were expressed as pg/ml. Statistical analysis was performed using Statistical Analysis System version 8 (SAS Institute, Cary, NC, USA, 2002).

### Results

We found that preoperative IFN- $\gamma$  concentration is significantly higher in women with subsequent polypropylene mesh erosion when compared to women with successful outcome ( $P < 0.04$ ).

### Interpretation of results

Synthetic meshes are widely used for pelvic organ prolapse and stress urinary incontinence surgery. Prosthetic repair seems to be more reliable, especially when native tissues are of poor quality. The use of synthetic meshes also simplify surgical procedures and reduce operative duration and morbidity, but material must be inert, permanent and resistant to infection. Polypropylene seems to fulfill all these criteria [3]. When operations are performed according to established guidelines the way to lower the erosion rate may involve exclusion of the patients immunologically prone to synthetic material erosion. The factor which can help to select such patients could be preoperative level of IFN- $\gamma$ .

### Concluding message

Th-1 cytokine profile may be related to the risk of the vaginal erosions following placement of polypropylene meshes.

### References

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**HUMAN SUBJECTS:** This study was approved by the Ethics Comitee, Medical University, Lublin, Poland. and followed the Declaration of Helsinki Informed consent was obtained from the patients.