PZ12 Clinical microbiology III – examination in urogenital infections

To study: special bacteriology from your own protocols

Urinary tract infections

Task 1: Sampling and transport of uri	ne
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According to the teacher's explanation, tick which sentences concerning urine sampling and transportation are Urine examination is recommended in non-complicated and necessary in complicated cystitis. □ true □ false Microbiologists recommend the use of catheterized urine as a routine way of sampling the urine for bacteriology. □ true □ false It is not important whether foreskin (prepuce – in men) or labia minora (in women) are in the way of urine stream during sampling the urine for bacteriology. □ true □ false External orifice of urethra should be carefully washed and eventually also disinfected before sampling the urine for bacteriology. □ true □ false The vessel into which the patient urinates should be sterile. □ true □ false The test tube used for urine transportation to the laboratory should have a yellow cap.

I true

false If urine is not "routinely taken", the order form should contain information whether it has been catheterized, punctured, or whether it is a specimen taken from a permanent catheter. □ true □ false Urine from a permanent catheter is equally important for bacteriological diagnostics as the catheterized urine (just for examination). □ true □ false Urine specimen should be delivered to the laboratory within 2 hours after sampling; if this is impossible, it should be kept in a refrigerator. □ true □ false Urine sample is better than urethral swab in gonorrhoea diagnostics. □ true □ false Task 2: Inoculation of sample of urine Observe your teacher demonstrating for you inoculation of sample of urine (or video with the same topic, if available). Fill in empty places in the following text: Urine sample is inoculated using calibrated loop, made of . The term "calibrated" means that it is set to specific volume, usually _____. The specimen of urine is inoculated to two media: _____. Instead of the second medium we could also use ______ or _____. After inoculation, the specimen is incubated overnight in a thermostat at °C. Task 3: Evaluation of semiquantitative cultivation of urine After inoculation and incubation (see Task 2), the agar plates with result of urine specimen cultivation are evaluated. The number of colonies is counted (of estimated approximately) and recounted to number of bacteria in a mililitre of the original specimen of urine. Number of Number of bacteria in Number of bacteria Interpretation colonies on agar one microlitre of the in one mililitre of the original urine (µl) original urine (ml) <10 10-100 >100

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Identification

Code:

Probability %

T index

Patient: Carolii	na Red	52 Dg.	: accute	cystitis			
Specimen: normal urine Ordered by: Dr. Microbe Terrible							
Growth on Blood agar:	Growth on Endo a	igar:		Conclusion:	Interpretation		
Quantity:	Enterotest 16 res	ult:					
Antibiotic susceptibility test			Final cond for treatm		commentation		
			9				

Task 4: Interpretation and treatment of UTI

It is really important to know that e. g. asymptomatic bacteruria normally does not require antibiotic therapy, that drug of choice should be always preferred if possible etc. Nevertheless, for time reasons dental student do not perform this task.

Infections of genital system

Task 5: Sampling methods in STIs and other infections of reproductive organs

Find suitable swabs or other sampling methods for following clinical situations (suspicions for individual diseases). For some of them more than one sampling method is suitable. Use numbers 1 to 6 and mark your choice to individual situations. Correct yourself with help of your teacher.

Bacterial vaginosis Syphilis

Aerobic vaginitis

Vaginal mycosis

Gonorrhoea

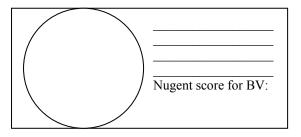
Mycoplasma infection
Chlamydia infection
Papillomavirus infection

Numbers: 1 - Amies swab 2 - C. A. T. swab 3 - plain (dry) swab 4 - a smear on a slide 5 - clotted blood for indirect examination 6 - ulcus durum scraping for dark-field microscopy and PCR

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Task 6: Evaluation of vaginal smears

In diagnostics of vaginal infections, one very important method is microscopy. Cultivation results may be positive even when the amount of bacteria (e. g. *Gardnerella* sp.) is not significant. Therefore, microscopy is better, because we can see the ratio between various morphotypes of bacteria, and also other structures (epithelial cells including those with adhered bacteria – so called "clue cells"; white blood cells; yeast cells etc.). Sometimes, two smears are sent to the laboratory: one is stained by Giemsa staining (almost



because of Trichomonas vaginalis diagnostics, as *T. vaginalis* cannot be Gram stained very well) and the other by Gram (especially for bacteriology).

Observe a result of a vaginal smear and draw your result in the laboratory report. Try to count Nugent score of bacterial vaginosis with help of following table.

("Morphotype Lactobacillus" = robust and long G+ rods; "morphotype Gardnerella" = subtle Gram-negative or Gram-variable straight rods; "morphotype Mobiluncus" = subtle Gram-negative curved rods. "Morphotype" means "bacteria that look in microscope the same as", so not all representativess of "Gardnerella morphotype" really belong to Gardnerella genus.)

The Nugent scoring system (adapted):

Score	Lactobacillus Morphotype per field	Gardnerella morphotype per field	Curved bacteria (Mobiluncus) per field
0	>30	0	0
1	5-30	<1	1-5
2	1-4	1-4	>5
3	<1	5-30	
4	0	>30	

The criterion for bacterial vaginosis according to Nugent's criteria is a total score of 7 or more is labeled as Bacterial Vaginosis a score of 4 to 6 is called intermediate, and a score of 0 to 3 is considered normal. Reliability of diagnosing bacterial vaginosis is improved by a standardized method of gram stain interpretation. R P Nugent, M A Krohn, and S L Hillier, J Clin Microbiol. 1991 February; 29(2): 297–301.

Task 7: Evaluation of vaginal swabs

Vaginal swabs are usually cultured on blood agar, Endo agar, agar with 10 % NaCl, special blood agar for *Gardnerella vaginalis*, eventually also VL agar (anaerobic culture). As a normal flora, we can observe lactobacilli: very tiny colonies with viridation. There exist many species of lactobacilli, with different relations with oxygen, although they use to be microaerofilic. Nevertheless, sometimes they are able to grow on blood agar in normal atmosphere, sometimes in *Gardnerella* agar in an incubator with elevated CO₂ concentration, and sometimes under anaerobic conditions only. Besides lactobacilli, normal finding may contain small amounts of staphylococci, *Enterobacteriaceae* and some other bacteria. Sometimes lactobacili are absent, especially in swabs taken from women after climacterium.

Dental students do not perform this task practically.

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