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URINARY TRACT INFECTIONS

Colonization and infection

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Ureteral stenting (the insertion of the Double-J catheter) is and in the near future will remain one of the most common urological interventions. Consequently, bacterial and fungal complication of this stenting are in the focus of many controversial discussions [1].

These discussions are related not only to differences between patient selections, but also to differences in interpretation of basic definitions, such as colonization and infection.

For most authors, colonization means infection and is the first stage of microbial infection by the establishment of the pathogen at the appropriate portal of entry. For a reduced number of authors, colonization and infection remain two different processes. All multicellular organisms are colonized to some degree by extrinsic organisms, and the vast majority of these exist in either a mutualistic or commensal relationship with the host. The difference between an infection and colonization is often only a matter of circumstance. Non-pathogenic organisms can become pathogenic given specific conditions, and even the most virulent organism requires certain circumstances to cause a compromising infection.

According to "Gale Encyclopedia of Medicine" [2], colonization is the presence of bacteria on a body surface (like on the skin, mouth, intestines or airway) without causing disease in the person.

Infection is the invasion of a host organism's bodily tissues by disease-causing organisms. Infection also results from the interplay between pathogens and the defenses of the hosts they infect.

The article "Rate of positive urine culture and double –J catheters colonization on the basis of microorganism DNA analysis" [3] states that "these results point a rule that stent insertion practically means its colonization", and the underlying inconsistency between urine infection and stent colonization confirms the presumption that colonization of the stents and urine infections are two different entities. Though they are related to one another, in a urinary infection, other risk factor such as age, comorbidities, basic urinary illness and the reason for stenting have the determinant role.

It is worth mentioning here, that the problem of colonization-infection occurs in other circumstances, interestingly all implantable medical devices, such as central venous catheters [4], pace-makers and TEP-s [5].

In biological conditions, where there are approximately ten times as many bacterial cells in the human flora as there are human cells in the body, and where it is a "rule that stent insertion practically means its colonization" may we say that "colonization" is a special form of "integration" of implantable medical devices in the host organism?

The conclusion of this article also raises another question: the problem of antibiotic prophylaxis. If all the patients had negative urine cultures before stenting and after a shorter or longer time, the rate of colonization tended to be 100%, then this also means that colonization happens independent of antibiotic prophylaxis. Does antibiotic prophylaxis have a role in prevention of colonization or is only a factor in selecting the bacterial species?

The literature is also controversial in this topic. It is well known that possible benefits of antibiotic prophylaxis must be balanced against possible adverse effects, such as development of antibiotic resistant bacteria.

Our world is changing; there is much good that can be done through collaborative and cooperative efforts. As we forge new alliances in our quest to eliminate preventable health care–associated infection, we should also consider a call to new and mutually beneficial ways of coexisting with the microbial flora of the world [6, 7].

In conclusion, this article has the merit that answers two important questions,
(the frequency of colonization and the low predictive value of urine culture) but the great merit consists in raising other basic questions, such as the problem of colonization and that of antibiotic prophylaxis.

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References

1. Niël-Weise BS, van den Broek PJ, da Silva EM, Silva LA. Urinary catheter policies for long-term bladder drainage. Cochrane Database Syt Revue. 201215; 8: CD004201.

2. Gale Encyclopedia of Medicine. Copyright 2008 The Gale Group, Inc.

3. Kliś R, Szymkowiak S, Madej A, Blewniewski M, Krześlak A, Forma E, et al. Rate of positive urine culture and double-J catheters colonization on the basis of microorganism DNA analysis. Cent European J Urol. 2014, 67: 81-85.

4. Raad I, Darouiche R, Dupuis J, Abi-Said D, Gabrielli A, Hachem R, et al. Central venous catheter coated with minocycline and rifampin for the prevention of catheter – related colonization and bloodstream infections. A randomized, double –blind trial. The Texas Medical Center Catheter Study Group. Ann Intern Med. 1997; 127: 267-274.

5. de Beer J, Petruccelli D, Rotstein C, Weening B, Royston K, Winemaker M. Antibiotic prophylaxis for total joint replacement surgery: results of a survey of Canadian orthopaedic surgeons. Can J Surg. 2009; 52: E229-234.

6. Lederberg J. Infectious history. Science. 2000; 288: 287-293.

7. Kathryn B. Kirkland. Bacterial Colonization: Can We Live With It? Clin Infect Dis. 2006; 48: 1382-1384.

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