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The Thistle QA CEU No is: **MT00025**.

Each attendee should claim **THREE** CEU points for completing this Quality Control Journal Club exercise, and retain a copy of the relevant Thistle QA Participation Certificate as proof of registration on a Thistle QA EQA.

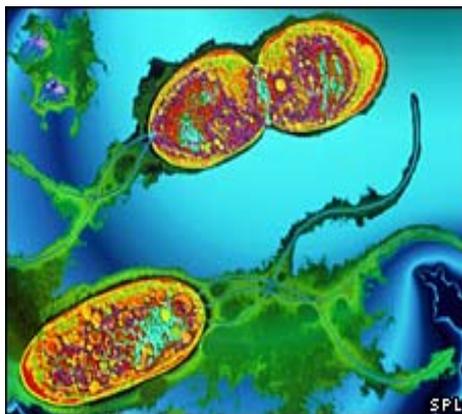
MICROBIOLOGY LEGEND

CYCLE 28 - ORGANISM 5

Stenotrophomonas maltophilia

Stenotrophomonas maltophilia is an aerobic, non-fermentative, Gram-negative bacterium. It is an uncommon bacterium and human infection is difficult to treat. Initially classified as *Pseudomonas maltophilia*, *S. maltophilia* was also grouped in the genus *Xanthomonas* before eventually becoming the type species of the genus *Stenotrophomonas* in 1993.

S. maltophilia are slightly smaller ($0.7-1.8 \times 0.4-0.7 \mu\text{m}$) than other members of the genus. They are motile due to polar flagella and grow well on McConkey agar producing pigmented colonies. *S. maltophilia* are catalase-positive, oxidase-negative (which distinguishes them from most other members of the genus) and have a positive reaction for extracellular DNase.



Pathogenesis

S. maltophilia is a water organism, and it survives and multiplies in aqueous environments, particularly respiratory secretions, urine, intravenous fluids, and irrigant solutions. *S. maltophilia* may persist in an aquatic environment for extended periods. Because *S. maltophilia* infections are extremely uncommon, no specific patient history suggests its presence other than contact with other colonized individuals.

S. maltophilia has few pathogenic mechanisms and, for this reason, predominantly results in colonization rather than infection. If infection does occur, invasive medical devices are usually the vehicles through which the organism bypasses normal host defences. Otherwise, the pathophysiology of this non-fermentative aerobic gram-negative bacillus does not differ from other non-fermentative aerobic organisms. Signs and symptoms of *S. maltophilia* infections are related to the organ system involved and are indistinguishable from infections with other pathogens.

S. maltophilia frequently colonizes breathing tubes such as endotracheal or tracheotomy tubes, the respiratory tract and indwelling urinary catheters. Infection is usually facilitated by the presence of prosthetic material (plastic or metal), and the most effective treatment is removal of the prosthetic material (usually a central venous catheter or similar device). The growth of *S. maltophilia* in microbiological cultures of respiratory or urinary specimens is therefore sometimes difficult to interpret and not a proof of infection. If, however, it is grown from sites which would be normally sterile (e.g. blood), then it usually represents true infection.

In immuno-competent individuals, *S. maltophilia* is a relatively unusual cause of pneumonia, urinary tract infection, or blood stream infection; in immuno-compromised patients, however, *S. maltophilia* is a growing source of latent pulmonary infections. *S. maltophilia* colonization rates in individuals with cystic fibrosis have been increasing.

Obtaining a history of the use of irrigant solutions that could potentially contain *S. maltophilia* is important in an epidemiological setting rather than in a clinical setting. Sources of *S. maltophilia* colonization include the following:

- Personnel
- Hands
- Antiseptic soaps
- Hand lotion
- Respiratory equipment and/or fluids
- Ultrasonic nebulizers
- Inhalation medications
- Respirator tubing condensate
- Intravenous lines and/or fluids
- Intravenous solutions
- Central venous catheters
- Pressure monitoring devices - Pressure transducer fluids
- Urine and/or fluids
- Indwelling Foley catheters
- Urometers
- Irrigation solutions

Mortality/Morbidity

Mortality and morbidity relate to the inoculum of *S. maltophilia* that is able to bypass normal host defence mechanisms. If an intravenous infusion contains large numbers of *S. maltophilia*, then direct injection into the bloodstream may result in the signs and symptoms associated with gram-negative bacteraemia. Similarly, in the urinary tract, if urological irrigation fluids that contain large numbers of *S. maltophilia* are used during an invasive urological procedure, e.g. cystoscopy, then gram-negative bacteraemia may occur with its attendant mortality and morbidity, which depend on host factors.

Treatment

S. maltophilia is naturally resistant to many broad-spectrum antibiotics (including all Carbapenems) and is thus often difficult to eradicate. Many strains of *S. maltophilia* are sensitive to Co-Trimoxazole and Ticarcillin, though resistance has been increasing. It is not usually sensitive to Piperacillin, and sensitivity to Ceftazidime is variable.

References

1. http://org/wiki/Stenotrophomonas_maltophilia
2. *Stenotrophomonas Maltophilia* Author: Burke A Cunha, MD, Professor of Medicine, State University of New York School of Medicine at Stony Brook; Chief, Infectious Disease Division, Winthrop-University Hospital

Questions

1. Discuss the morphological features of *S. maltophilia*.
 2. Discuss the pathogenesis of *S. maltophilia*.
 3. What are the antibiotics of choice in the treatment of a patient diagnosed with a *maltophilia* infection?
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