

Analysis of *Streptococcus bovis* infections at a monographic oncological centre

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The *Streptococcus bovis* is a Gram-positive, facultative anaerobic, catalase and oxidase negative coccus belonging to the genus *Streptococcus*. It is part of *Streptococcus bovis/equinus* complex and it express the Lancefield antigen D on the surface.

This complex has been characterized by molecular biology techniques and specifically by 16S rRNA and *sodA* gene. Phylogenetic trees based on these techniques are complex and therefore the routine work in laboratories, biochemical techniques are used to identify subspecies if it is necessary.

The complex is divided into two subtypes based on biochemical properties: positive mannitol fermentation (biotype I) including *S. gallolyticus* (*S. gallolyticus* subsp. *gallolyticus* and *S. gallolyticus* subsp. *macedonicus*), mannitol negative and β -glucuronidase negative (biotype II/ 1), which includes more species (*S. infantarius* subsp. *coli* and *S. lutetiensis*) and mannitol negative and β -glucuronidase positive (biotype II/ 2), with a single species called *S. gallolyticus* subsp. *pasteurianus*.

Owing to the relationship between colon cancer tumour and *Streptococcus bovis*, we intend to analyse all isolates in our hospital between the periods of 2010 until March 2013 and analyse tumor epidemiology at our center, in patients infected with this pathogen.

Despite the different types of samples and out of the possibility of identification of subspecies, were isolated 14 *S. bovis* of 14 different patients. The isolates patients were (at the beginning): 4 blood (blood culture), 5 urine, 4 multiple exudates and 1 bronchoalveolar lavage. The proportion of men and women was 8/6. The mean age was 67 years (56 ± 91). Malignant tumor distribution was: 6 prostate cancer, 1 breast cancer, 1 biliary tract, 1 skin, 1, stomach, 1 uterus, 1 vulvar, 1 pyriform sinus and other reproductive organs without specify.

The study of antimicrobial *in vitro* susceptibility was performed by microdilution (MicroScan® WalkAway, Siemens, Sacramento, CA, USA) and the interpretation of the results by the standards of the CLSI (Clinical and Laboratory Standards Institute), M100- S18. The results were: 14 strains (100%) were sensitive to ampicillin (≤ 0.25 mcg / mL), amoxicillin-clavulanate ($\leq 4/2$ mg / mL), penicillin G (≤ 0.12 mcg / mL), cefotaxime (≤ 1 μ g / mL), teicoplanin (≤ 8 mcg / mL), vancomycin (≤ 1 μ g / mL) and nitrofurantoin (≤ 32 mg / mL), 5 strains (35.71%) were resistant to clindamycin (≥ 1 μ g / mL), 6 (42.85%) erythromycin (≥ 8 g / mL), 4 (28.57%), gentamicin (≥ 16 mg / mL), 3 (21.42%), tobramycin (≥ 16 mg / mL), 6 (42.85%) to levofloxacin (≥ 8 mcg / mL), 8 (57.14%) to ciprofloxacin (≥ 4 mg / mL), 9 (64.28%) to tetracycline (≥ 8 mcg / mL) and 6 (42.58%) to trimethoprim-sulfamethoxazole ($\geq 8/152$ ug / mL).

Regarding to the pathogenicity, there are reports on the degree of colonization of *S. bovis* (*S. gallolyticus* subsp. *gallolyticus*) and colon cancer [1]. It postulates several mechanisms involved in its pathogeny [2] and it known the adhesion potential and invasion of endothelial cells or the ability to form biofilms [3], but if it is true, the relationship between colonization and oncogenesis is not entirely well defined.

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After analysing the isolated tumour epidemiology of our findings, no one of them was obtained from faecal samples or has been part of some study or active search for this microorganism.

In our series, 42.85% had prostate cancer and nobody had colon cancer. With respect to *in vitro* sensitivity, isolates showed a phenotypic profile of sensitivity consistent to the rest of the references [4].

Currently it have been associated some of these isolates with other types of tumour and biliary pathology or pathologies hematologic [5] even more reason to start or enhance screening centres similar to ours.

Conflict of interest

The authors wish to express that they have no conflict of interest.

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