Preoperative antibiotic prophylaxis

Because of a low risk of infections in neurosurgery (around 2-3%), antibiotic prophylaxis is a controversial issue.

In neurosurgery began with the use of the antiseptic hexamine in 1925 and has continued till present with the introduction of new drugs from penicillin to vancomycin[1]. Although clean neurosurgical procedures without implantation of foreign devices carry a low risk of postoperative infection, yet the application of prophylactic antibiotic is now a routine in neurosurgery. This fact was supported by the results of multiple published studies[2][3].

Preoperative antibiotic prophylaxis is one of the preventive measures for surgical site infections (SSIs). Very little data about the cost effectiveness of the appropriate duration of antibiotic prophylaxis in low- and middle-income countries are available.

A cost-analysis study demonstrates that prolonged antibiotic prophylaxis correlates with increased burden of cost, but it is not preventive for SSI[4].

see Pediatric antibiotic prophylaxis.

Different antibiotics and administration regimes have been used in the perioperative prophylaxis so far, and there are numerous comparative studies regarding their efficiency, however, it is generally indicated that the choice thereof should be based on information and local specifics connected to the most probable bacterial causers, which would possibly contaminate the surgical site and cause infection, and moreover, the mandatory compliance with the principles of providing adequate concentration of the drug at the time of the anticipated contamination.

Administration of parenteral antibiotics before surgery reduces the incidence of postoperative infections after neurosurgical procedures, especially in cases with increased risk factors for SSI, such as ACA score of ≥ 2/3, the duration of the surgical intervention ≥ 4 hours, contaminated wound and comorbidities. Perioperative antibiotic prophylaxis should be directed to better coverage of the S.aureus arrays[5].

The invasive nature of surgery carries high risk for the transfer of pathogens responsible for surgical site infections (SSI).

Since the pioneering study of Mallis[6] who reported the beneficial effects of local and preoperative antibiotic prophylaxis in clean neurosurgical wound infection, many randomized and meta-analysis studies confirmed the benefit of antibiotic prophylaxis in reducing the incidence of surgical site infection[7][8][9][10][11].

The protocol of antibiotic prophylaxis is different among centers and the majority of previous publications came from The United States or Europe and rarely from developing countries.
The available evidence to assess the effect of wearing additional gloves, intraoperative glove change or type of gloves on SSI rates is very limited and of low-quality. Our findings indicate the need for RCTs on this topic \(^{12}\).  

Double gloving is the practice of wearing two layers of medical gloves to reduce the danger of infection from glove failure or penetration of the gloves by sharp objects during medical procedures. A systematic review of the literature has shown double gloving to offer significantly more protection against inner glove perforation in surgical procedures compared to the use of a single glove layer \(^{13}\) \(^{14}\).

The local application of powdered \textit{vancomycin} was not associated with a significant difference in the rate of deep SSI after spinal deformity surgery, and other treatment modalities are necessary to limit infection for this high-risk group. This study is in contrary to prior studies, which have reported a decrease in SSI with vancomycin powder. Level of Evidence: 2 \(^{15}\).

Drain tip culture had a high positivity rate in the SSI group and the coincidence rate for the causative pathogen was relatively high \(^{16}\).  


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