To analyze the etiology and risk factors of central venous catheter (CVCs) infections, and to explore the prophylaxis and treatment for catheter-related infections” Zhang et al (2017).

Abstract:

OBJECTIVE: To analyze the etiology and risk factors of central venous catheter (CVCs) infections, and to explore the prophylaxis and treatment for catheter-related infections.

METHODS: A retrospective study was conducted. The patients with CVCs admitted to intensive care unit (ICU) of Qianfoshan Hospital Affiliated to Shandong University from January 2000 to December 2016 were enrolled. The gender, age, catheter data and microorganism culture results of all patients were collected. The infection rate and the incidences of CVCs infection per 1 000 catheter days were calculated. The risk factors of CVCs infection were analyzed by Logistic regression.

RESULTS: 1 160 patients were enrolled in 17 years. The incidences of CVCs infection per 1 000 catheter days were descended every 3 years (cases/1 000 days: 21.87, 24.50, 19.95, 12.64, 16.34, 12.40, χ² = 38.851, P = 0.000). Of the 1 160 patients, 375 were positive for
catheter culture, and 397 strains were cultured, among which 173 strains (43.58%) were Gram negative (G-), 130 strains (32.74%) of Gram positive (G+), and 94 strains of fungi (23.68%). Non-fermenting bacteria (Pseudomonas aeruginosa 11.59%, Acinetobacter baumannii 8.82%) was predominant in the G- bacteria, followed by Enterobacteria (Klebsiella pneumoniae 8.06%, Escherichia coli 2.02%); Staphylococcus spp. (Staphylococcus epidermidis 11.84%, Staphylococcus aureus 5.29%) was the main species of G+ bacteria; the main fungi were Candida tropicalis (9.07%) and Candida albicans (5.79%). The catheter infection rate of internal jugular vein, femoral vein and subclavian vein were 36.07% (22/61), 35.52% (119/335), 30.63% (234/764) respectively ($\chi^2 = 2.275$, $P = 0.099$), the incidence of catheter infection of three vein insertion sites per 1 000 catheter days were 18.00, 17.71, 17.08 cases/1 000 days respectively ($\chi^2 = 0.034$, $P = 0.714$). The mean placement time of infected CVCs in situ was longer than that of non-infected CVCs (days: 20.80±11.68 vs. 17.64±10.77, $t = 4.417$, $P = 0.000$). The positive rate was lowest during 1-7 days of indwelling time (19.87%, 30/151). The infection rate was increased with long indwelling time. The positive rate was 44.44% (68/153) as indwelling time was over 30 days. The infection rate was significantly positively related to indwelling time ($\chi^2 = 22.849$, $P = 0.000$). Multiple Logistic regression analysis showed that the infection risk of femoral vein catheter was increased as compared with that of subclavian vein catheter; the infection risk was increased with long indwelling time (OR = 1.306, 95%CI = 1.177-1.480, $P = 0.000$).

CONCLUSIONS: G- are the major pathogens of CVCs infection. Femoral vein catheter and long indwelling time are the risk factors of CVCs infection.

Reference: