



# Bacterial and Fungal Infections in the Early Post-transplantation Period After Liver Transplantation: Etiologic Agents and Their Susceptibility

D. Kawecki<sup>a,\*</sup>, M. Pacholczyk<sup>b</sup>, B. Lagiewska<sup>b</sup>, A. Sawicka-Grzelak<sup>a</sup>, M. Durlik<sup>c</sup>, G. Mlynarczyk<sup>a</sup>, and A. Chmura<sup>b</sup>

<sup>a</sup>Department of Medical Microbiology, Medical University of Warsaw, Poland; <sup>b</sup>Department of General Surgery and Transplantation, Medical University of Warsaw, Poland; and <sup>c</sup>Department of Transplant Medicine and Nephrology, Transplantation Institute, Medical University of Warsaw, Poland

---

## ABSTRACT

**Objective.** It has been reported in many studies that one of the main factors influencing morbidity and mortality in patients receiving transplants is infection after transplantation.

**Patients and Methods.** The study included 190 adult patients undergoing orthotopic liver transplantation (OLT) between September 2001 and December 2007. All the patients were followed prospectively for infections from the OLT date and during the first 4 weeks after surgery. Immunosuppression consisted of steroids and tacrolimus. Antimicrobial prophylaxis included piperacillin/tazobactam, fluconazole, and selective bowel decontamination (SBD) was performed. Samples of clinical materials were investigated for microbiological cultures. The micro-organisms were cultured and identified in accordance with standard bacteriological procedures. Susceptibility testing was performed using Clinical and Laboratory Standards Institute procedures.

**Results.** From 190 OLT recipients, 2213 clinical samples were obtained for microbiological examination. Positive cultures were found in 27.2% (n = 603) of all samples tested; 1252 strains were collected. Gram-positive bacteria were found in 64.1% (n = 802), Gram-negative bacteria were found in 31.6% (n = 396), and fungal strains were isolated in 4.3% (n = 54). Surgical site specimens (n = 1031) were obtained from 190 recipients during the first month after transplantation. Positive cultures accounted for 29.2% (n = 301) of all samples tested. Among the isolated microbial strains (n = 677), most common were Gram-positive bacteria (73.7%; n = 499). Gram-negative bacteria comprised 25.1% (n = 170). There were fungal strains in 1.2% (n = 8). There were 539 urine specimens. Positive cultures accounted for 16.7% (n = 90) of those. Among the isolated microbial strains (n = 210), most common were Gram-negative bacteria (62.4%; n = 131). Gram-positive bacteria comprised 28.6% (n = 60) and fungi 9% (n = 19). There were 549 blood specimens. Positive cultures were found in 30.6% (n = 168) of all samples tested. Among the isolated microbial strains (n = 263), most common were Gram-positive bacteria in 72.3% (n = 190); Gram-negative bacteria were found in 26.2% (n = 69), and fungal strains were isolated in 1.5% (n = 4). There were 69 respiratory tract specimens. Positive cultures were found in 46.4% (n = 32) of all samples tested. Among the isolated microbial strains (n = 84), most common were Gram-positive bacteria (51.2%; n = 43); Gram-negative bacteria comprised 27.4% (n = 23) and fungi 21.4% (n = 18).

---

\*Address correspondence to Dariusz Kawecki, MD, PhD, Warsaw, 5 Chalubinskiego Street, 02-004 Warsaw, Poland. Department of Medical Microbiology, Medical University of Warsaw. E-mail: [dkawecki@o2.pl](mailto:dkawecki@o2.pl)

**Conclusions.** (1) Surgical site samples were predominated samples after LTx. (2) Our study showed Gram-positive bacteria were 64.1% (n = 802), Gram-negative bacteria, 31.6% (n = 396) and fungal strains isolated in 4.3% (n = 54). (3) The increased proportion of isolates of multi-drug-resistant bacterial strains (methicillin resistant coagulase negative *Staphylococcus*, vancomycin-resistant *Enterococcus*, high-level aminoglycoside resistance, and extended-spectrum  $\beta$ -lactamase). (4) These data indicate strict cooperation infection control procedures in these patients.

**I**NFECTIONS remain serious complications in solid organ transplant recipients despite professional medical care, the introduction of new immunosuppressive drugs, and management which decreases the risk of infections [1-7].

Much of the data in the literature also indicates that the first month after transplantation is characterized by the occurrence of infections [8-11].

The development of the solid organ transplantation procedure in Poland during the last 2 decades requires a better understanding of the issue of infections in transplant recipients in our country [12]. According to the Poltransplant database, 2489 liver transplantations (LTs) were performed in Poland from 1998 to 2012 [13]. The aim of our study was to estimate the etiologic agents associated with bacteriuria and the susceptibility to antibacterial agents among patients after LT at the Department of General Surgery and Transplantation of the Transplantation Institute, Medical University of Warsaw, performed from 2001 to the end of 2007.

#### PATIENTS AND METHODS

The patient population included 190 LT recipients in the first month post-transplantation. Of these, 92 were women and 98 were men (mean age,  $45.1 \pm 11.5$  years) with end-stage liver disease who underwent transplantation between September 2001 and December 2007 and who survived for more than 72 hours. All recipients underwent orthotopic liver transplantation (OLT) (piggy back technique) and all had end-to-end choledochocholedochostomy with external drainage of bile through a Levin tube were followed prospectively for bacterial and fungal infections from the day of OLT and for the first 4 weeks after surgery. This 6-year-period of observation of transplantation patients had been subdivided into two sub-periods from 2001 to 2004 and from 2005 to 2007.

Standard immunosuppression consisted of calcineurin inhibitors with steroids according to recommendations of the Polish Transplantation Society. Antimicrobial prophylaxis was administered intravenously from the day of transplantation to the end of first week after OLT, including piperacillin/tazobactam  $3 \times 4.5$  g daily intravenously (Tazocin, Wyeth) and fluconazole 100 mg (Diflucan; Pfizer). Selective bowel decontamination (using a liquid suspension of amikacin and nystatin) was performed for the first 3 days after OLT according to recommendations of the Department of General Surgery and Transplantation of the Transplantation Institute, Medical University of Warsaw.

The micro-organisms were cultured and identified according to standard bacteriological procedures (ATB system, bio-Merieux). Susceptibility of the strains to antibacterial agents was made by the Clinical and Laboratory Standards Institute

guidelines. An analysis of the susceptibility of the strains to antimicrobial agents was performed for microbes that are pathogenic for humans. The presence of multidrug-resistant (MDR) bacterial strains after OLT required a separate susceptibility analysis for MDR strains.

Because of the different scope of medical management during the first month after transplantation, the microbiological results were analyzed separately for each of the consecutive 4 weeks. All data were recorded on standard forms and entered for computer analysis using MediStat software (MediStat, Poland). The differences between isolated strains in these four periods have been evaluated by statistical analysis using the SAS 9.1 (SAS Institute Inc., United States) program, the  $\chi^2$  test, and Fisher's exact test. Differences in incidence rates between two periods (2001-2004 versus 2005-2007) were performed using the bootstrap method. The significance level was considered to be  $\alpha = 0.05$ .

#### RESULTS

All the OLT recipients were followed prospectively for the first 4 weeks after surgery.

From 190 patients, 2213 clinical samples were obtained for microbiological examination. Positive cultures were found in 27.2% (n = 603) of all samples tested; 1252 strains were collected. Gram-positive bacteria were found in 64.1% (n = 802), Gram-negative bacteria in 31.6% (n = 396), and fungal strains were isolated in 4.3% (n = 54). Factor intensity/frequency of micro-organisms (known as the incidence rate [IR]) enabled a comparative analysis of the number of strains isolated from clinical samples of materials from the different groups of patients with different numbers in periods of different lengths [14,15].

Data from patients, isolated micro-organisms from clinical materials, and the IR in the early period after OLT are shown in Table 1.

#### Surgical Site Specimens

Surgical site specimens (n = 1031) were obtained from 190 recipients during the first month after transplantation. Positive cultures were found in 29.2% (n = 301) of all samples tested. Among the isolated microbial strains (n = 677), most common were Gram-positive bacteria (73.7%; n = 499). Gram-negative bacteria comprised 25.1% (n = 170). Fungal strains were found in 1.2% (n = 8).

Gram-positive bacteria, the most frequently isolated from the surgical site (SS) included: *staphylococci* 52.5% (n = 262). *Staphylococcus epidermidis* accounted for 43.9% (n = 115) isolates. Strains of Methicillin-resistant *Staphylococcus aureus* (MRSA)/Methicillin resistant coagulase negative

Download English Version:

<https://daneshyari.com/en/article/4257984>

Download Persian Version:

<https://daneshyari.com/article/4257984>

[Daneshyari.com](https://daneshyari.com)