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The impact of the different severe infections on the outcome of liver transplantation. A study of 150 patients

N. P. Mora, B. S. Husberg, T. A. Gonwa, R. Goldstein, and G. B. Klintmalm

Baylor University Medical Center, Transplantation Services, Dallas, Texas, USA

Severe infection (Sev Inf) is still the main cause of morbidity and mortality after liver transplantation (LTx) [2, 3, 4]. The aim of our study was to analyze how each type of infection, bacterial, fungal or viral, influences the rates of morbidity and mortality after LTx.

Key words: Liver transplantation – Infections

Patients and methods

Between March 1988 and December 1989, 180 LTx were performed in 150 adult patients with a follow-up of 5–26 months. Surgery was performed as described by Starzl et al. [6]. Standard immunosuppression with CyA plus prednisolone was administered. Intravenous imipenem was used as antibiotic prophylaxis intraoperatively and for the first 5–7 postoperative days. Selective antifungal prophylaxis was administered with low doses of amphotericin B in high-risk patients (i.e. in need of intensive care before LTx) for 10 days after LTx.

Sef Inf included all episodes of sepsis, meningitis, pneumonia, wound infection, gastrointestinal infection, peritonitis, intra-abdominal abscess, hepatic abscess, cholangitis, and hepatitis. The definition of Sev Inf excluded uncomplicated urinary infection, localized herpes infection, and infection episodes not requiring hospitalization. All fungal infections were included. Patients were divided into four groups according to the presence of the specific type of Sev Inf: bacterial (B), $n = 50$; fungal (F), $n = 19$; viral (V), $n = 44$; and not-infected patients (NI), $n = 72$. Patients with more than one type of Sev Inf entered more than one of the three groups.

The number of days in intensive care after LTx, total hospital stay, 3-month mortality rate and 1-year and 2-year actuarial patient survival in the three infection groups were compared with the NI group as control in order to assess how each type of Sev Inf affects the outcome of LTx.

Results

The results are summarized in Tables 1–4. NI patients demonstrated an optimal survival and outcome after LTx. When viral infection was present there was an increase in the number of days in intensive care and in the total length of hospital stay, but survival and 3-month mortality rates were not decreased significantly. Bacterial infections significantly affected 3-month mortality rates, and morbidity was also higher than in the NI group. The study presents a very low incidence of fungal infection, which was probably caused by the selective amphotericin protocol that was

Table 1. Patient survival after liver transplantation according to the presence of the different types of severe infections. NI, not infected; B, bacterial infection; F, fungal infection; V, viral infection. * $P = 0.0007$ vs NI; ** $P = 0.027$ vs NI

Group	6 months (%)	12 months (%)	18 months (%)	24 months (%)
NI ($n = 72$)	97.2	97.2	94.4	94.4
B ($n = 50$)	81.9*	71.5*	71.5*	71.5*
F ($n = 19$)	94.7	68.4**	68.4**	68.4**
V ($n = 44$)	93	86.6	86.6	86.6

Table 2. 90-day mortality after liver transplantation according to the presence of the different types of severe infections. NI, not infected; B, bacterial infection; F, fungal infection; V, viral infection. * $P = 0.031$ vs NI

Group	Deaths/patients	Mortality (%)
NI	2/72	2.78
B	7/50	14*
F	0/19	0
V	2/44	4.55

Table 3. Number of days in intensive care after liver transplantation according to the presence of the different types of severe infections. NI, not infected; B, bacterial infection; F, fungal infection; V, viral infection

Group	Mean ± SD	*P* value (versus NI)
NI ($n = 72$)	3 ± 11	
B ($n = 50$)	12 ± 15	0.0001
F ($n = 19$)	11 ± 14	0.0001
V ($n = 44$)	8 ± 11	0.0001

Offprint requests to: G. B. Klintmalm, M. D., Ph. D., Baylor University Medical Center, Transplantation Services, 3500 Gaston Avenue, Dallas, TX-75246, USA

Table 4. Total hospital stay (days) after liver transplantation according to the presence of the different types of severe infections. NI, not infected; B, bacterial infection; F, fungal infection; V, viral infection

Group	Mean ± SD	*P* value (versus NI)
NI (*n* = 72)	20 ± 17	
B (*n* = 50)	42 ± 31	0.0001
F (*n* = 19)	48 ± 32	0.0001
V (*n* = 44)	38 ± 27	0.0001

used. Nevertheless, fungal infection was associated with the lowest survival rate of the four groups, even though all deaths occurred later than the first 3 months after the first LTx.

Conclusions

Infection has been demonstrated to be the primary cause of death after liver transplantation [1]. Invasive fungal infections showed the worst prognosis with a high late mortality [5, 7]. Bacterial infections demonstrated higher morbidity and mortality after LTx compared with the NI group, and viral infections caused higher morbidity without modifying 3-month mortality and patient survival rates. To our knowledge, there are no previous studies focusing on how the three main types of infection affect the outcome and survival after LTx.

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