Poster No. 2379

IDWeek2017

Emma Elizabeth Ilett
PERSIMUNE/CHIP, Department of Infectious Diseases
Section 2100, Finsencentret, Blegdamsvej 9
DK-2100 Copenhagen Ø, Denmark
Tel: +45 35 45 58 88, +45 30 23 41 32
emma.elizabeth.ilett.01@regionh.dk

Clostridium difficile Infection in Solid Organ and Haematopoietic Stem Cell Transplant Recipients

EE Ilett[1], H Sengeløv[2], SS Sørensen[3], F Gustafsson[4], M Perch[4], A Rasmussen[5], J Lundgren[1], N Frimodt-Møller[6], M Helleberg[1]

[1]Centre of Excellence for Health, Immunity and Infections (CHIP), Department of Infectious Diseases, Rigshospitalet, Copenhagen, Denmark, [2]Department of Haematology, Rigshospitalet, Copenhagen, Denmark, [3]Department of Nephrology, Rigshospitalet, Copenhagen, Denmark, [4]Department of Cardiology, Rigshospitalet, Copenhagen, Denmark, [5]Department of Surgical Gastroenterology, Rigshospitalet, Copenhagen, Denmark, [6]Department of Microbiology, Rigshospitalet, Copenhagen, Denmark

INTRODUCTION

- Solid organ transplantation (SOT) and haematopoietic stem cell transplantation (HSCT) recipients have a higher incidence of *Clostridium difficile* infection (CDI) in comparison to non-transplantation patients[1-3].
- The consequences of CDI in SOT and HSCT recipients can include increased mortality, longer hospital stay and a higher incidence of complications[4].
- Previous studies have examined single, or fewer types of transplant patients, with shorter or incomplete follow-up.
- Here, using nationwide data, with full patient record access and complete follow-up, we examine rates of CDI before and after SOT or HSCT, as well as rates of recurrent CDI.

METHODS AND DESIGN

- All adults > 18 years of age undergoing SOT or HSCT between January 1st 2010 and February 21st 2017, at a large tertiary transplant centre in Copenhagen were retrospectively identified.
- Patients were followed using national electronic data capture from 6 months prior to transplantation until closure of the study period.
- Relative risks were estimated by Poisson Regression analyses, adjusted for age, gender, and year of transplantation.
- CDI occurring up to 6 months prior to transplantation was assessed as a risk factor for post-transplantation CDI.

RESULTS

- Among 1150 SOT and 586 HSCT recipients, 252 (15%) developed a CDI after transplantation (**Table 1**).
- Incidence rate (IR)s were highest within the first 2 months post-transplantation and among liver, lung and myeloablative HSCT recipients (**Table 2** and **Figure 1a and 1b**).

Table 1

Patient characteristics of the study cohort

Characteristics	Total N= 1736	SOT N= 1150	HSCT N= 586
Median age (IQR) years	51 (41-61)	51 (41-59)	54 (42-63)
Male gender (%)	1,054 (61)	699 (61)	355 (61)
Total person years of follow-up	4,609	3,267	1,342
Median person years of follow-up (IQR)	2.2 (0.6-5.3)	2.5 (0.8-4.9)	1.6 (0.4-4.0)
N transplant type (% of total)			
HSCT			
Myeloablative HSCT			240 (14)
Mini HSCT			360 (18)
Umbilical cord HSCT			40 (2)
SOT			
Kidney		565 (33)	
Liver		276 (16)	
Lung		210 (12)	
Heart		84 (5)	
Pancreas-kidney		12 (<1)	
Liver-kidney		3 (<1)	
Number of re-transplantations	43	32	11
Number of patients with CDI post-transplantation	252	142	110
Number of patients with recurring CDI post-transplantation	52	32	20

Table 2

Incidence rates and incidence rate ratios of pre-transplantation CDI, first post-transplantation CDI and recurrent CDI post-transplantation for SOT and HSCT patients respectively

	Pre-Transplantation	Post-Transplantation					
	≤6 months	≤2 months		>2 months		Recurrent C.difficile*	
	IR/1000 PY (n C.diff/ n PY)	IR/1000 PY (n C.diff/ n PY)	IRR (95%CI)	IR/1000 PY (n C.diff/ n PY)	IRR (95%CI)	IR/1000 PY (n C.diff/ n PY)	IRR (95%CI)
SOT	**14** (8/557)	**457** (79/173)		**20** (63/3086)		**98** (17/174)	
Kidney	**0** (0/278)	**190** (17/90)	Ref.	**20** (35/1729)	Ref.	**66** (6/91)	Ref.
Heart	**0** (0/41)	**76** (1/13)	**0.4** (0.1-3.0)	**12** (3/249)	**0.6** (0.2-1.9)	**0** (0/5)	-
Lung	**20** (2/102)	**573** (18/31)	**3.0** (1.5-5.8)	**16** (8/493)	**0.8** (0.4-1.7)	**105** (2/19)	**1.9** (0.6-5.5)
Liver	45 (6/134)	**1120** (43/38)	**5.8** (3.3-10.2)	**28** (17/615)	**1.4** (0.8-2.5)	**155** (9/58)	**1.1** (0.2-5.9)
HSCT	**95** (25/264)	**541** (45/83)		**54** (60/1105)		**124** (14/113)	
Non-myeloablative HSCT	**81** (12/148)	**314** (15/48)	Ref.	**57** (37/650)	Ref.	**98** (6/61)	Ref.
Myeloablative HSCT	**112** (13/116)	**848** (30/35)	**2.2** (1.1-4.6)	**51** (23/455)	**0.8** (0.4-1.6)	**155** (8/52)	**3.1** (0.8-11.2)

(IRR adjusted for age, gender and transplantation year)
(*≤6 months after transplantation)

RESULTS – CONT.

- Pre-transplantation rates of CDI were similar to those seen after the first 2 months post-transplantation.
- SOT recipients who had experienced a pre-transplantation CDI were at greater risk of developing early CDI post-transplantation (IR ratio (IRR) 6.1 (95% confidence interval (CI) 2.2-17.1).
- Rates of recurrent CDI after transplantation (i.e. the second CDI after transplantation) were comparable for SOT and HSCT recipients (**Table 2**).

CONCLUSIONS

Transplantation type, close proximity to time after transplantation, and a CDI episode prior to transplantation (in SOT recipients) are associated with an increased risk of CDI.

All transplantation types have a markedly higher risk of CDI the first 2 months post-transplantation, but not subsequently, with the highest risk among liver, lung and HSCT recipients.

PERSPECTIVES

These findings warrant further investigation into the causes and risk factors of CDI in HSCT and SOT recipients respectively, and once accomplished, open the possibility to develop preventive measures close to time of transplantation for those identified to be at excess risk. Identification of excess risk groups could potentially reduce morbidity among transplant recipients.

1. Paudel S, Zacharioudakis IM, Zervou FN, et al. PloS one 2015;**10**(4):e0124483.
2. Guddati AK, Kumar G, Ahmed S, et al. International journal of hematology 2014;**99**(6):758-65.
3. Mani S, Rybicki L, Jagadeesh D, et al. Bone marrow transplantation 2016;**51**(5):713-7.
4. Pant C, Anderson MP, O'Connor JA, et al. Transplant infectious disease : an official journal of the Transplantation Society 2012;**14**(5):540-7.

Figure 1a

Cumulative Risk of C. difficile Infection after Solid Organ Transplantation

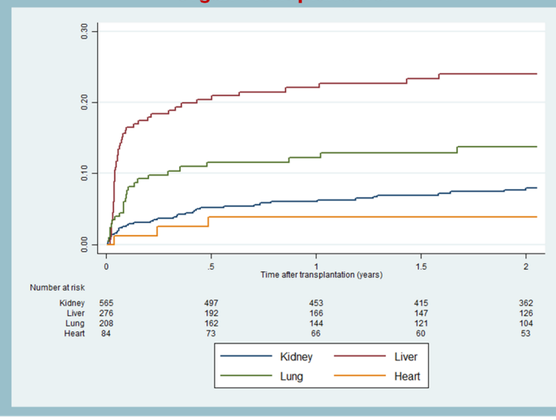
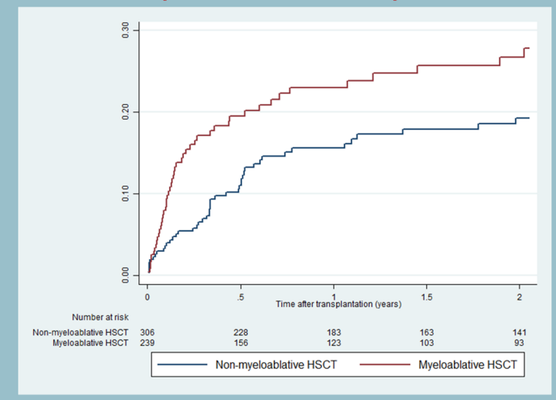


Figure 1b

Cumulative Risk of C. difficile Infection after Haematopoietic Stem Cell Transplantation



Download poster at: www.chip.dk