Healthcare Resource Use and Associated Costs of Patients with Diffuse Large B-Cell Lymphoma treated with CAR-T cells in France – A real-world study using data from PMSI

ISPOR Europe
Vienna
November 6-9, 2022

Acceptance code: EE138

Di Blasi R[1], Thieblemont C[1], Haioun C[2], Sackmann Sala L[3], Mayaud AC[3], Diez-Andreu P[4], Bugnard F[4], Goguillot M[4], Finzi J[3], Chillotti L[4], Bénard S[4]

[1]Saint-Louis hospital, Paris, France,
[2]Henri Mondor Teaching Hospital, AP-HP, Créteil, France,
[3]Incyte Biosciences France, Boulogne-Billancourt, France,
[4]stève consultants, Oullins, France

Introduction

- **Diffuse Large B-Cell Lymphoma (DLBCL)** is the **most frequent non-Hodgkin's lymphoma (NHL) ; DLBCL** represents more than 30% of NHL in Europe (1) and approximately 21% of all lymphomas and other lymphoid malignancies. More than **5,000 DLBCL were newly diagnosed cases in 2018** in France (2,3).
- Treatment strategies for DLBCL depend on 3 main criteria: patient age, International Prognostic Index (IPI) score and feasibility of dose-intensified chemotherapy approaches (4).
- The most frequent DLBCL first line therapy is based on immunochemotherapy associating, rituximab while subsequent treatment lines use immunochemotherapy and CAR-T cells therapy (5).
- In France, CAR-T-cells therapy is a possible treatment in 3rd line or more for DLBCL since 2017 (6,7).
  - ➢ **This study aimed at describing HealthCare Resource Use (HCRU) and costs in DLBCL patients treated with CAR-T cells according to failure status.**

Methods

- **Study design**
  - This was a descriptive, retrospective, longitudinal study using secondary data from French hospital database (PMSI).
  - DLBCL patients treated by CAR-T cells were identified over 2017-2020 period and were followed-up for 6 months after CAR-T cells administration or until inpatient death, whichever occurred first.
  - Patients having received more than one CAR-T administration were excluded
- **Data source**

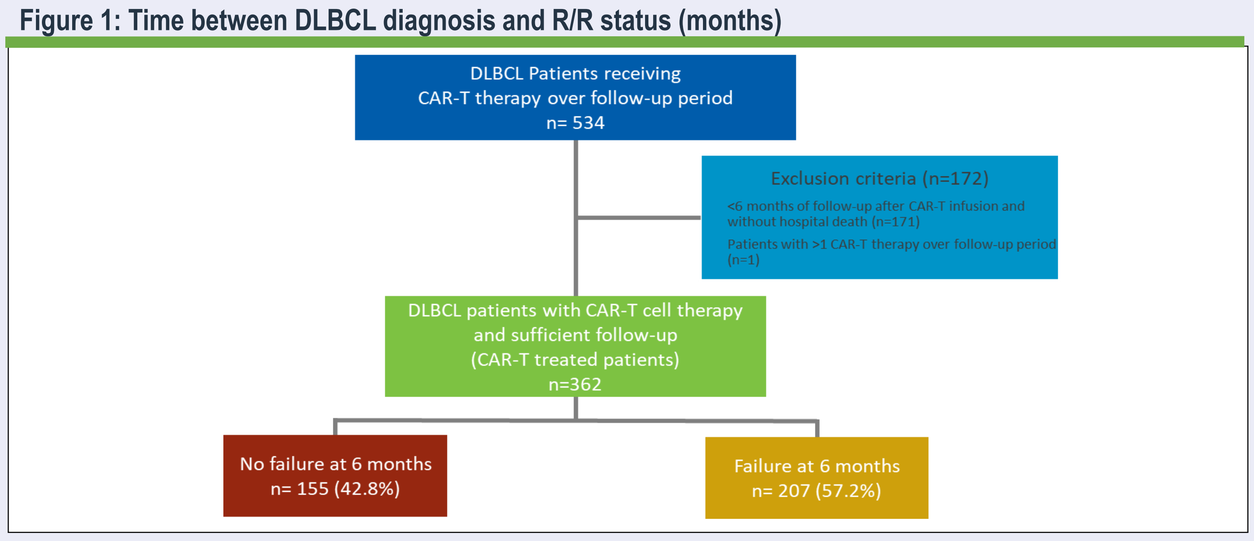
PMSI database exhaustively includes French hospital-related claims irrespective of healthcare insurance system or hospital settings (public/private). It is composed of four main domains: medicine, surgery and obstetric (MCO); home care (HAD); post-acute care and rehabilitation (SSR) and psychiatry (PSY). MCO, SSR and HAD have been used to carry out this study.

- **Statistical method**
  - Patients were classified according to whether or not they had a failure within 6 months after CAR-T cells treatment, defined as receiving a new therapy or an inpatient death.
  - HCRU and costs were assessed monthly between 6 months before and 6 months after CAR-T cells administration.
  - Cost analyses were performed by adding all retrieved tariffs, overall and by type of healthcare resources used (notably hospitalizations in MCO, SSR, HAD, hospital specialist visits in public hospitals only in MCO, additional charges in MCO and Expensive drugs ("Liste en sus" drugs and CAR-T) and expensive medical devices when available in MCO, SSR and HAD).
  - Tariffs were reported in 2020 Euros (€).

Results

- **Study population** (Figure 1)
  - Among the 534 patients treated with CAR-T over the study period (2017-2020), **362** had sufficient follow-up or a recorded inpatient death.
  - Among them, 2 subgroups were considered:
    - Patients with no new treatment nor death within 6 months after infusion, referred as "**No failure at 6 months": n=155**;
    - Patients with either a new DLBCL therapy or in-hospital death within 6 months after infusion, referred as **"Failure at 6 months": n=207.**

Figure 1: Time between DLBCL diagnosis and R/R status (months)



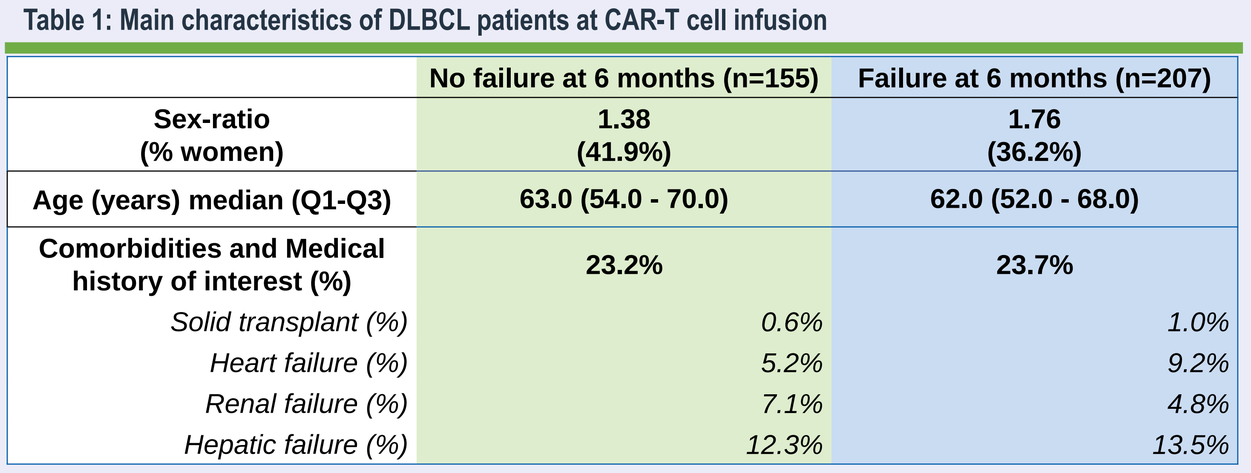
- **Patients characteristics** (Table 1)
  - Among the 362 CAR-T treated patients, there were **more men than women**. **Sex ratio** was **1.76 in failure group** and was **1.38 in non-failure group**.
  - **Median (Q1-Q3) ages** were **63.0 (54.0 - 70.0) and 62.0 (52.0 - 68.0)** years among patients with and without failure, respectively.
  - **Less than 25%** (23.5%) **of CAR-T treated patients** had at least **one comorbidity or medical history of interest at index stay**. Hepatic failure was the most frequent comorbidity of interest, accounting for around 13% of patients whatever the group (13.5% for patients with failure and 12.3% for patients without failure at 6 months). Less than 1% of patients had a history of solid transplant.

Table 1: Main characteristics of DLBCL patients at CAR-T cell infusion

	No failure at 6 months (n=155)	Failure at 6 months (n=207)
Sex-ratio (% women)	**1.38 (41.9%)**	**1.76 (36.2%)**
Age (years) median (Q1-Q3)	**63.0 (54.0 - 70.0)**	**62.0 (52.0 - 68.0)**
Comorbidities and Medical history of interest (%)	**23.2%**	**23.7%**
Solid transplant (%)	*0.6%*	*1.0%*
Heart failure (%)	*5.2%*	*9.2%*
Renal failure (%)	*7.1%*	*4.8%*
Hepatic failure (%)	*12.3%*	*13.5%*

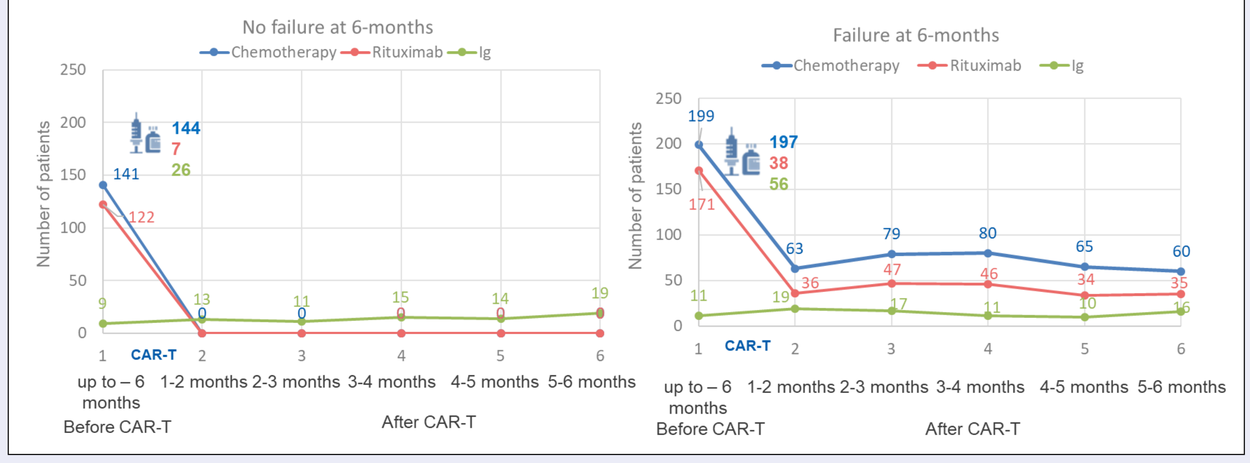
- **Hospitalization after CAR-T cell infusion according to the failure status at 6 months**
  - **Within 1 month after CAR-T**, HCRU were similar between patients with and without failure at 6 months
  - **After CAR-T cell infusion:**
    - 75% of patients in failure group had ≥1 hospitalization per month vs. 25% in no failure group (Figure 2)
    - Very few patients (less than 5%) were managed in SSR and HAD for patients without failure. This rate was slightly higher for patients with failure.

Figure 2: Number (%) of patients with at least one MCO hospitalization for each period defined from 6 months before to 6 months after CAR-T cells injection



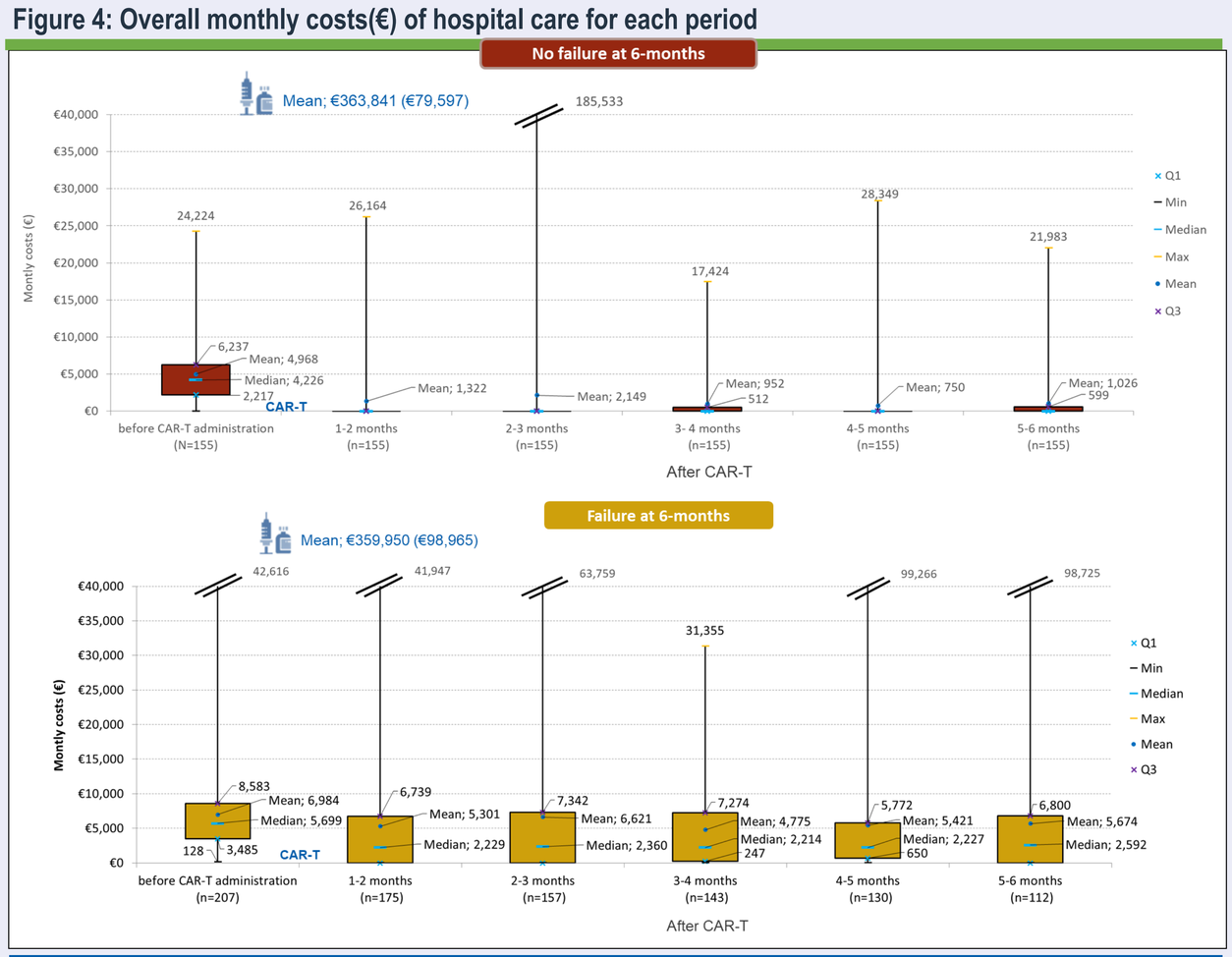
- **Treatment after CAR-T cell infusion according to the failure status at 6 month**
  - **During the month of CAR T infusion,** >90 % of patients had ≥1 chemotherapy session (including lymphodepletion) and patients with failure at 6 months were more likely to receive rituximab (18,4% vs. 4.5%). Immunoglobulin (Ig) administration was also more frequent in the failure group (27.1% vs.16.8%).
  - **During following periods** (Figure 3):
    - Overall, Ig administration was stable regardless of the time frame,
    - Patients without failure did not receive chemotherapy or rituximab after CAR-T treatment, while half of the patients with failure received ≥1 chemotherapy session per month.

Figure 3: Number of patients with treatments of interest for each period defined from 6 months before to 6 months after CAR-T cell administration



- **Costs according to the failure status at 6 month** (Figure 4)
  - Overall associated costs were similar before (≈€5,000) and during CAR-T cells stay (≈€360,000) regardless of failure status.
  - Moreover, from the 2nd month post-CAR-T cells administration, mean (±SD) hospital costs ranged between €4,775 (±6,110) and €6,621 (±10,414) in failure group, and between €750 (±2,719) and €2,149 (±15,218) in no-failure group.

Figure 4: Overall monthly costs(€) of hospital care for each period



Conclusions

Patients without failure at 6 months after CAR-T cell have very low monthly hospital costs within the first six months after CAR-T infusion. Meanwhile, patients with failure must be frequently hospitalized and treated, leading to greater healthcare costs.

Disclosure

Di Blasi: Speaker – Gilead, Novartis, Janssen, Pfizer - Travel and accommodation: Gilead **Thieblemont:** Speaker – Novartis, BMS/Celgene, Bayer, AbbVie, Gilead Sciences, Roche, Janssen, Kite, Incyte, Amgen, Takeda – Travel and accommodation: Novartis, BMS/Celgene, Bayer, AbbVie, Gilead Sciences, Roche, Janssen, Kite, Amgen, Takeda – Research grant: Janssen, Roche – Consultancy/honoraria: Novartis, BMS/Celgene, Bayer, AbbVie, Gilead Sciences, Roche, Janssen, Kite, Incyte, Amgen, Takeda, **Haioun:** Honoraria – Miltenyi, Roche, Celgene, Incyte, Pfizer, Gilead, Janssen – Travel and accommodation: Roche, Janssen **Sackmann Sala:** Employee and stock ownership – Incyte Corporation**, Mayaud:** Employee and stock ownership – Incyte Corporation**, Diez-Andreu:** Employee – stève consultants (commissioned by Incyte Corporation to conduct these analyses), **Bugnard:** Employee – stève consultants (commissioned by Incyte Corporation to conduct these analyses)**, Goguillot:** Employee – stève consultants (commissioned by Incyte Corporation to conduct these analyses), **Finzi:** Employee and stock ownership – Incyte Corporation**, Chillotti:** Employee – stève consultants (commissioned by Incyte Corporation to conduct these analyses)**, Bénard:** Employee and stock ownership – stève consultants (commissioned by Incyte Corporation to conduct these analyses)**.**

Acknowledgement

This study was sponsored by Inyte Biosciences France (Boulogne-Billancourt.

References

1. Sehn LH, Salles G. Diffuse Large B-Cell Lymphoma; N Engl J Med. 2021 Mar 4; 384(9): 842–858. **2.** Comprendre les lymphomes non hodgkiniens - Ref : GUILYMPH19 [accessed 28 Jun 2021] **3.** MCO par GHM ou racine | Stats ATIH [accessed 28 Jun 2021] **4.** Tilly H, Gomes da Silva M, Vitolo U, Jack A, Meignan M, Lopez-Guillermo A, et al. Diffuse large B-cell lymphoma (DLBCL): ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Ann Oncol. sept 2015;26 Suppl 5:v116-125 **5**. Cheson BD, Fisher RI, Barrington SF, Cavalli F, Schwartz LH, Zucca E, et al. Recommendations for Initial Evaluation, Staging, and Response Assessment of Hodgkin and Non-Hodgkin Lymphoma: The Lugano Classification. JCO. 20 sept 2014;32(27):3059-67 **6**, CAR T versus ASCT for R/R B-cell NHL [accessed 21 Jul 2021]
7. Li C, Zhang Y, Zhang C, Chen J, Lou X, Chen X, et al. Comparison of CAR-T19 and autologous stem cell transplantation for refractory/relapsed non-Hodgkin's lymphoma. JCI Insight [accessed 2 Aug 2021]