Epidemiology and real-world treatment management of Paroxysmal Nocturnal Hemoglobinuria in France

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Introduction

- **Paroxysmal nocturnal hemoglobinuria** (PNH) is a rare, life-threatening, complement mediated hematological disorder, characterized by hemolytic **anemia**, **aplasia** and **thromboses**, with an estimated prevalence of **1/80,000 in France**.
- Aside from hematopoietic stem cell transplantation, PNH therapy is centered on **C5 inhibitor antibodies** (i.e eculizumab and ravulizumab) and **proximal complement inhibition** approach (pegcetacoplan, single C3 inhibitor approved so far), along with **iterative red blood cells (RBC) transfusions**.
- French data on PNH epidemiology and management in a real-world setting are scarce in the era of complement inhibition.

Objectives

The main objectives of this study were to **describe PNH epidemiology**, patients' **characteristics**, and the **therapeutic pathways** of patients treated with C5 inhibitor in real word settings in France, as well as **need for transfusion**.

Methods

- **Real-world, national, descriptive secondary data use study** using the French national hospital database (PMSI) between 2014 and 2022.
- Patients with ≥1 hospital **diagnosis of PNH (ICD-10 code D59.5** as main, related or associated diagnosis) or a C5 inhibitor for PNH between **January 1, 2018, and December 31, 2022**, were selected. Among them, patients with other diseases potentially treated with a C5 inhibitor were excluded (hemolytic uremic syndrome, myasthenia gravis and neuromyelitis optica).
- The first PNH-related hospitalization identified within the study period was considered as the index date. **Epidemiology and patients' characteristics were described at the index date** according to prevalence status and C5 inhibitor treatment status. Medical history was assessed over a **historical period from January 1, 2014**.
- Patients treated with a **C5 inhibitor were followed from their first dispensation until last hospital** stay for treatment management description. A subgroup of **patients initiating a C5 inhibitor during selection period with ≥6 months** of follow-up was also extracted (Figure 1) .
- Other diseases potentially treated with a C5 inhibitor were identified using **ICD-10** codes, C5 inhibitors were identified based on **ATC** codes, and transfusions using French procedure classification codes (**CCAM**).

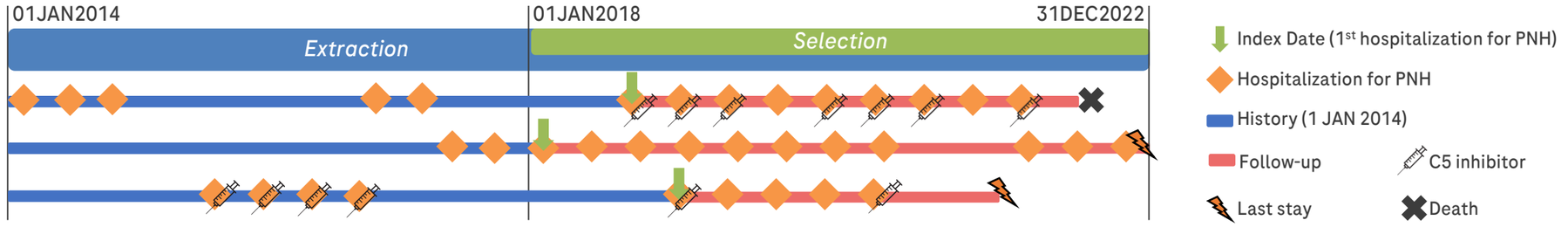
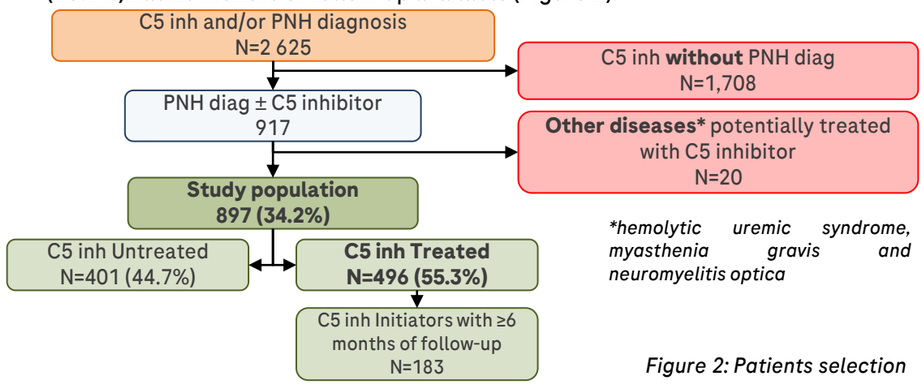


Figure 1: Study Design

Results (1/3)

- Among the 917 patients with a PNH diagnosis and/or C5 inhibitor dispensation for PNH between 2018 and 2022, 20 (2.2%) patients presented other diseases potentially treated with C5 inhibitor, and **897 (97.8%) were included in the study**.
- **More than half (n= 496, 55.3%) of patients were treated with C5 inhibitor**, of whom 218 (24.3%) initiated their treatment during the selection period, and 183 (20.4%) had ≥6 months of follow-up available (Figure 2).



**hemolytic uremic syndrome, myasthenia gravis and neuromyelitis optica*

Figure 2: Patients selection

Results (2/3)

- **Each year, ≈100 new patients** are identified, leading to a prevalence increasing from **581 patients in 2018 to 725 in 2022**. During this period, the number of patients newly treated with C5 inhibitor increased from 38 to 164 (Figure 3).
- At C5 inhibitor initiation, mean age was **45.7 (19.4) years**, with **45,9% of women**. Among them, 6.9% of patients presented with hepatic failure and 6.9% diabetes.
- In 2022, 100 new patients were identified, 28 of whom initiated a C5 inhibitor during the year.

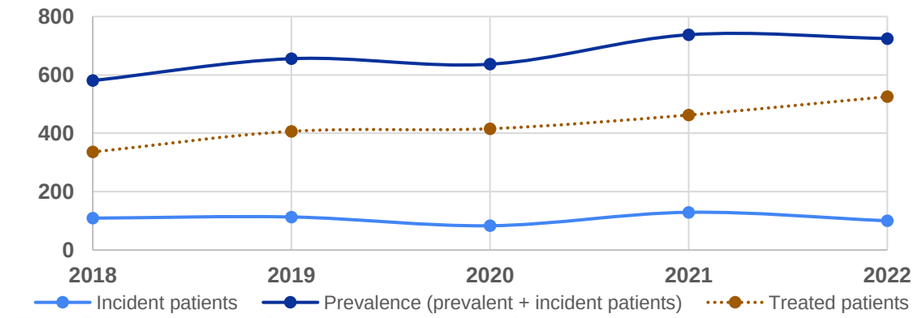


Figure 3: Annual number of patients and treated patients

Results (3/3)

- Among C5 inhibitor initiators with ≥6 months of follow-up (n=183), **the mean (SD) annual number of stays for C5 inhibitor infusion was 20.9 (6.9)**. Overall, 22 (10.1%) patients initiated with RAVU, and 196 (89.9%) with ECU, of whom 80 (40.8%) switched to RAVU in 2022, and 8 switched back to ECU (Figure 4).
- **The number of transfusion decreased with follow-up**, with 69.3% of patients not transfused during the first 6 months, and 82.6% after 1 year of C5 inhibitor treatment (Figure 5).

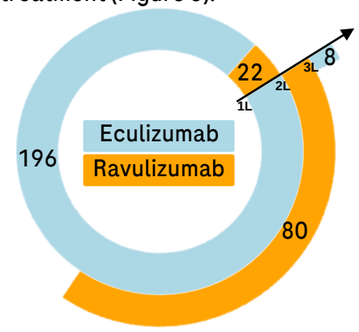


Figure 4: C5 inhibitor treatment pathway

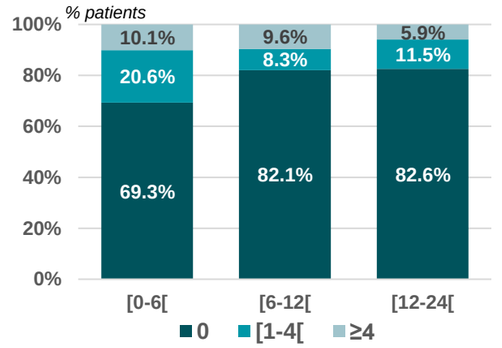


Figure 5: nb of transfusions over follow-up

Conclusion

- This study brings updated data on the current epidemiology in France and management of PNH.
- Based on this PMSI study, the prevalence of PNH in France was estimated at 725 patients in 2022 (=1/94 000), including 100 newly diagnosed patients, 28 of whom initiated a treatment with C5 inhibitor.
- Overall, more than half of the patients are treated with C5 inhibitor. The number of patients initiating a C5 inhibitor increased from 38 in 2018 to 164 in 2022.
- Most of the patients initiated their C5 inhibitor treatment with eculizumab, then switched to ravulizumab.
- The use of transfusions decreased with follow-up after C5 inhibitor initiation, highlighting the effectiveness of the treatments.

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