Clotting factors consumption in hemophilia A and B according to patients' characteristics: results from the FranceCoag Network

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Introduction

Clotting factors consumption in hemophilia is highly variable. Our objectives were to assess the annual mean consumption of Clotting Factor Concentrates (CFC) according to various parameters and to identify the consumption's associated factors. Indeed, the associations with some parameters are well known: severity of hemophilia, treatment modality (on-demand/prophylaxis), surgical procedures and presence of an inhibitor. However, some of them are less studied: type of hemophilia, age, bodyweight, calendar year, type of clotting factor (recombinant/plasmatic) and desmopressin administration.

Methods

The analysis was based on the prospective cohort of hemophilia patients, which was implemented in 1994 and includes today almost all patients followed-up in the French treatment centres. Initially focusing on severe haemophilia, the protocol was modified and a large number of mild and moderate hemophilia patients were enrolled since 2003. Thus, we restricted the analysis to periods after 2003. This first analysis focused on periods with **on-demand therapy without surgical procedures or inhibitors**. The assessement criteria was the number of CFC consumed per kilograms weight per year (IU.kg^{-1}.year^{-1}).

Results

By November 2011, 5,846 hemophiliacs were included in FranceCoag Network. Among them, 4,185 (representing 13,037 person-years) follow the selection criteria: 3,388 HA (81%) and 797 HB (19%).

The annual mean consumption was **354 IU.kg^{-1}.year^{-1}** representing **10 exposure days per year** and a total of **22,222 IU.year^{-1}**.

Severity of hemophilia

Disease severity is a major factor influencing CFC consumption. For moderate hemophilia, the mean consumption varies widely according to the lowest basal level of coagulation factors, falling from 464 IU.kg^{-1}.year^{-1} for patients presenting a basal level of 1% to 211 IU.kg^{-1}.year^{-1} for those with a level of 2%.

FIGURE 1 — Annual mean consumption (IU.kg^{-1}.year^{-1}) of CFC according to disease severity

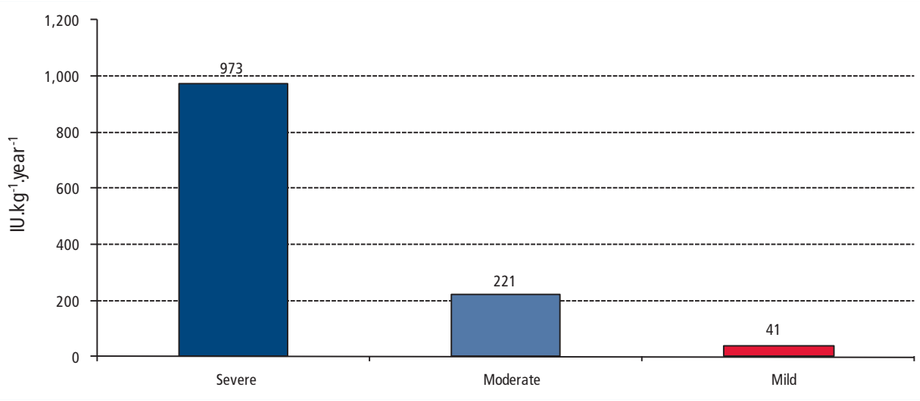
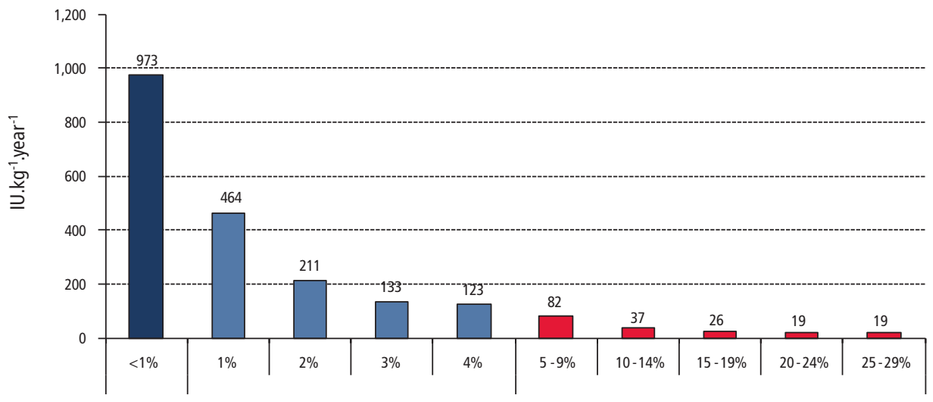
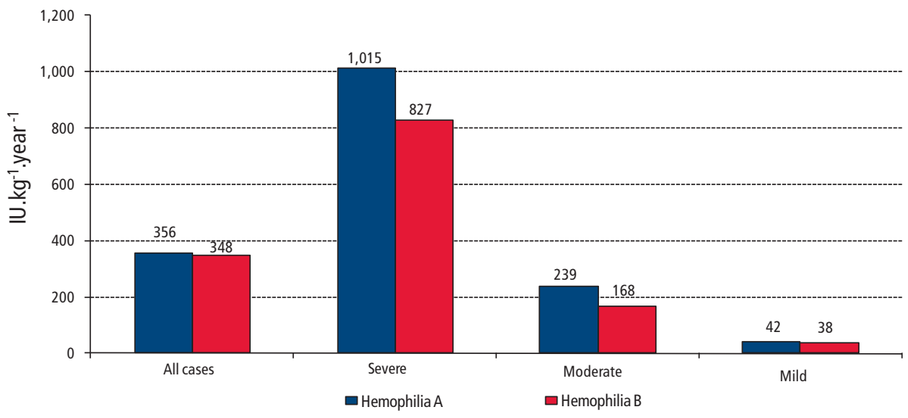


FIGURE 2 — Annual mean consumption (IU.kg^{-1}.year^{-1}) of CFC according to the basal level of coagulation factor



Type of hemophilia

FIGURE 3 — Annual mean consumption (IU.kg^{-1}.year^{-1}) of clotting factor concentrates according to type of hemophilia



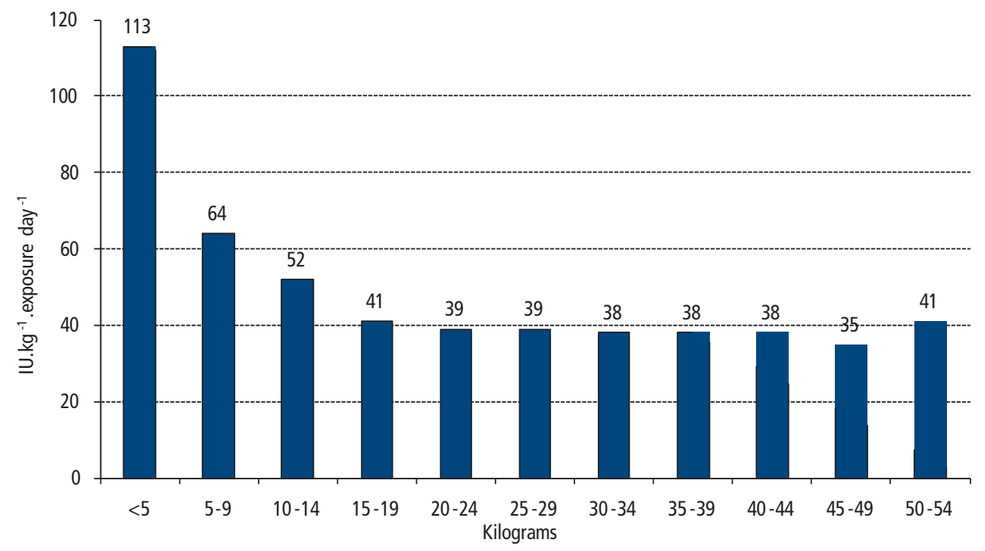
The annual mean consumption was higher for hemophilia A. This may be due (at least in part) to a higher half-life of factor IX concentrate.

Age

Regarding the age, the annual mean consumption **rises up to 16-18** and **decreases after 30 years old**.

Bodyweight (among childred <16 years old)

FIGURE 4 — Annual mean consumption (IU.kg^{-1}.exposure day^{-1}) of CFC according to bodyweight among children (<16 years)



The mean consumption per exposure day is higher for patients with a bodyweight below 5 kg compared with those above 5 kg (103 *vs.* 38IU.kg^{-1} per exposure day). This may be related to a lower factor recovery among the youngest patients (for whom the dosage should be expressed in IU per square meter of body surface area instead of IU per kilograms) and/or to the drug packaging which is inadequate for the lowest bodyweight.

Calendar year

The annual mean consumption of CFC in IU.kg^{-1}.year^{-1} was stable between 2003 and 2011.

Conclusion and perspectives

This study provides an accurate assessment of the national consumptions of CFC in hemophilia according to various parameters. Further parameters will be also investigated (e.g. type of administered clotting factor). A statistical model including all parameters will then be computed to assess the independent impact of each factor.

This first analysis was conducted on periods with on demand therapy without surgical procedures or inhibitor i.e. periods without any major factor influencing CFC consumption. We will investigate, as a second step, the effect of prophylaxis and some surgical procedures on CFC consumption.

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