

## CORRESPONDENCE



# Impact of COVID-19 pandemic on the use and release of cord blood units facilitated by the French Cord Blood Banks Network: on behalf of the Agency of Biomedicine, Eurocord and the French Society of Bone Marrow Transplant and Cell Therapy (SFGM-TC)

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**TO THE EDITOR**

The emergence of COVID-19 as a pandemic in early 2020 has impacted different aspects of stem cell transplant practice around the world. Transplant physicians were forced to face major challenges to maintain access to urgent transplants [1–5].

National lockdown, international frontiers closing, flight and train circulation restrictions, internationally as well as within France, were established to control COVID-19 spread, making more challenging stem cells procurement from international and national donors. In addition, transplant teams had to tackle unpredicted situations related to donor and harvest staff exposure to the virus, which were likely to have an impact in stem cell clearance for donation.

Due to the emergence of COVID-19, the World Marrow Donor Association (WMDA) [6], the European Society for Blood and Marrow Transplantation (EBMT) [7, 8] and all national and international registries published recommendations to maintain safe access to urgent hematopoietic stem cell transplants [9–11]. They recommended to cryopreserve all grafts and give preference to domestic donors and cord blood over international ones.

This study aims to retrospectively review the impact of the Covid-19 pandemic on the collection and utilization of unrelated umbilical cord blood units (UCB) facilitated by the French Cord Blood Banks (CBB) Network during 2020 in comparison to 2019.

From January to December 2020, 4392 UCB were collected by the French CBB Network, compared to 7989 units in 2019; there was a 45% decrease in the collection activity in 2020. The impact was most prominent during the 2-month lockdown period in France (March 17th through May 10th, 2020) when UCB harvesting activity was totally stopped (Fig. 1a).

A total of 154 UCB units were facilitated by the French CBB Network in 2020 to transplant both national (96 units) and international recipients (58 units). No significant difference in indications for UCB transplantation (UCBT) was observed between national and international patients. Median age at UCBT was 31.8 years (0.2–70) and was lower for national recipients (median of 14.3 years) compared to international ones (median of 44.8 years). Fifty-five national recipients and 49 international recipients of UCBT were children (<18 years). Fifty-eight units provided by international CBB were imported to transplant national recipients and 58 units provided by French CBB Network were exported for international patients. Most countries involved in UCB exchange activity with the French CBB Network in 2020 were in Europe

(44%) and USA (36%). There was 24% decrease in unit exchange with the American CBB (42 units in 2020 vs. 55 in 2019) but we did not observe an impact on the global exchange activity in Europe (51 units both in 2020 and 2019).

Release activity from the French CBB Network inventory involved a total 96 units in 2020 (vs 105 in 2019). Fifty-eight units (60%) were released to transplant international recipients with a 21% reduction compared to the previous year (58 in 2020 vs 73 units in 2019) due to international borders closures that severely impacted the export of stem cell products to recipients outside of France (Fig. 1b). Thirty-eight units (40%) were used to transplant national recipients (Fig. 1c) which corresponds to a 19% increase in utilization of domestic UCB units by French transplant centers in 2020 (38 units vs 32 units in 2019). However, there was a 50% increase in global UCB release activity (39 units vs 26 in 2019) between March and May 2020, coinciding with the COVID-19 lockdown period in several countries, with high number of units released by the French CBB Network for both international (23 vs 18 in 2019) and national (16 vs 8 in 2019) recipients (Fig. 1b, c).

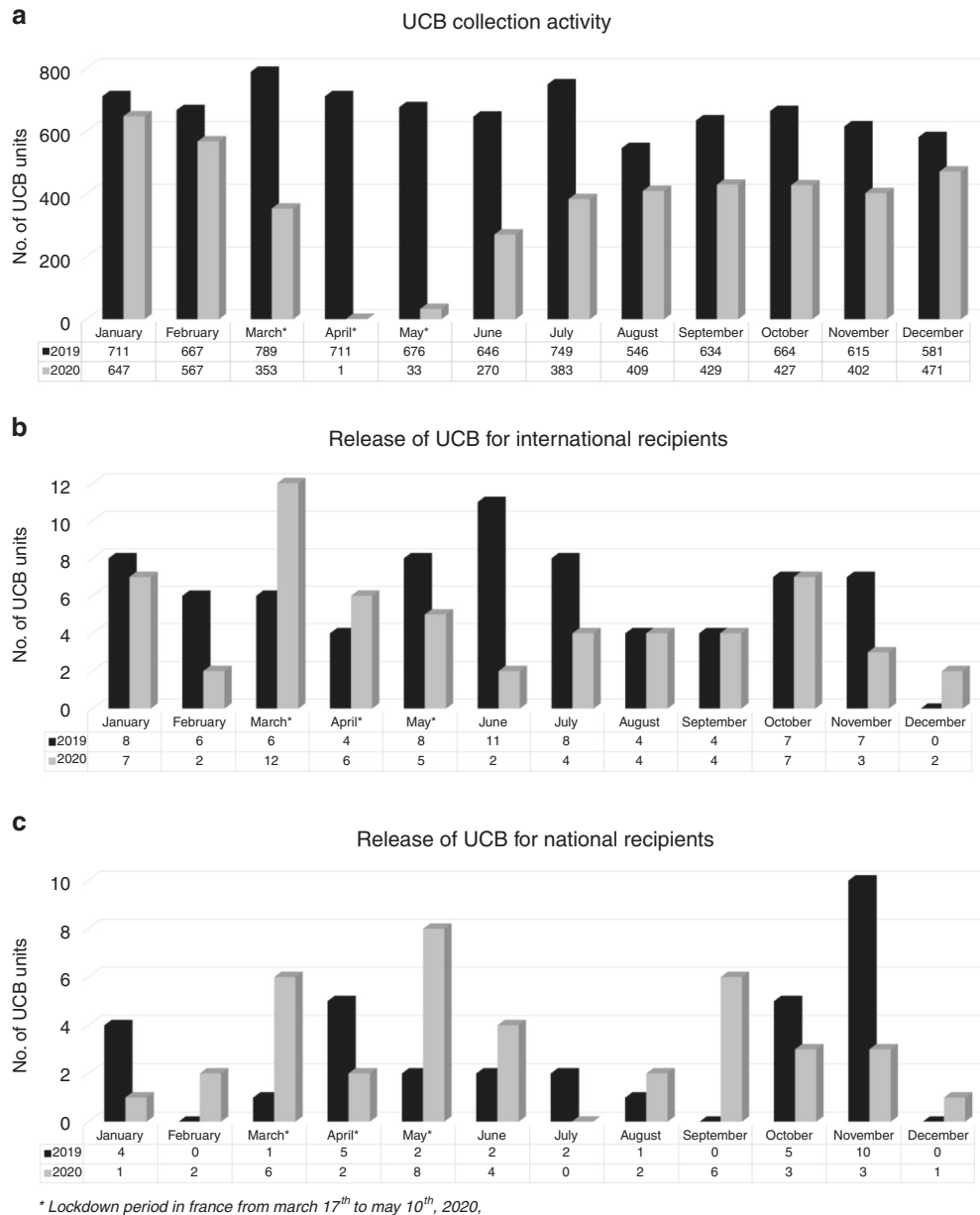
Import activity was not affected and involved 58 units that were imported in 2020 from international CBB to transplant national recipients (58 in 2019). Most (95%) units were imported from countries in Europe (37 units in 2020 vs 27 in 2019), USA (14 units in 2020 vs 24 in 2019) and UK (4 units in 2020 and 2019). However, there was a 37% increase in UCB units imported from Europe in 2020 and 42% decrease in units imported from USA.

Overall, the utilization rate of UCB for recipients in France increased 7% in 2020 (96 vs 90 units in 2019). Fifty-eight units (60%) were provided by international CBB and 38 (40%) were provided by the French CBB Network. Indications for UCBT were acute leukemia in majority (>60%) of cases (71 AML and 31 ALL in 2020 vs 68 AML and 34 ALL in 2019). Other indications included myelodysplastic syndrome (13 vs 21 in 2019), lymphoproliferative disorders (5 vs 9 in 2019), severe aplastic anemia (16 vs 11 in 2019), primary immunodeficiency (8 vs 9 in 2019) and metabolic disorders (6 as in 2019).

There was no statistically significant difference in cell doses of the UCB used for transplantation (collected TNC  $\times 10^7/\text{kg}$  of 4.3 in 2020 vs 5.9 in 2019,  $p = 0.44$ ).

Of the 1429 requests issued in 2020 for harvesting unrelated donor (bone marrow or peripheral blood stem cell) grafts, 392 were canceled resulting in a cancellation rate of 26% of the harvesting requests issued in 2020 compared to 28% (405/1454)

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**Fig. 1** Numbers of UCB units in 2020 and 2019. (a) UCB collected (b) UCB released for international recipients (c) UCB released for national recipients.

of those issued in 2019. The donor-related causes represented 46% of the reasons for cancellation in 2020 and 54% of those in 2019. However, we do not have the information if the cancellation was directly related to COVID 19.

Finally, of the 170 adult donor transplants unexpectedly canceled for donor-related causes in 2020, 13 (8%) transplants were performed using UCB as stem cell source (in comparison to 9 UCBT (4%) of the 222 adult donor transplants unexpectedly canceled in 2019).

The use of UCB for transplantation decreased worldwide in recent years with the development of haploidentical transplants. However, UCB remains a valuable stem cell source especially for ethnic minorities. UCB is a major resource during emergency situations (nuclear accidents, epidemics...) impacting the collection of blood and marrow as the units are typed, cryopreserved and ready for immediate use. UCB proved to be of critical importance during the current Covid-19 pandemic, mainly in its early phase due to strict lockdown in many countries, international border closures and

uncertainty related to COVID-19-delays in adult donor cell procurement. Having UCB readily available in the CBB allowed to bypass the complexity of stem cell procurement process and helped to transplant urgent patients rapidly and with safe products that had not been exposed to SARS-CoV-2. Also important, the use of UCB is an attractive solution for skipping the adult donor work-up and collection which implicates hospital visits, consequently, increasing the potential for donor exposure to viral contamination. Moreover, hospital access is usually very restricted in times of sanitary crisis like the one we are currently experiencing with SARS-CoV-2.

UCB allowed to maintain the transplant activity in France and avoid delaying urgent transplants during the pandemic. The impact was more prominent at the domestic level probably due to easier logistic for their national use. Simpler processes associated with unit procurement together with rapid unit availability and product safety may explain why the release of UCB was not slowed by the pandemic, with roughly similar number of units released by the French CBB Network in 2020 and 2019.

The SARS-CoV-2 pandemic highlighted the added value of this alternative graft source in emergency situations. Our study supports the importance of maintaining cord blood banks, preserving the UCB inventories and maximizing the collection of high quality cord blood units.

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## AUTHOR CONTRIBUTIONS

All authors contributed to manuscript preparation: conception and design of the study (EM, EG, II, HR); inclusion of patients (CB, DB, CC, BD, JDV, EGa, CG, JL, AC, VM, VP, FP, JBT, JHD, GM, JOB, MTR, MR); analysis and cleaning of data (HR, FG, CK); statistical analysis (MS, HR, FG); drafting the article (HR, II, FG); article revision (EG, FV, CF, AR, VR, EM). All the authors reviewed and approved the final version of the manuscript.

## COMPETING INTERESTS

The authors declare no competing interests.

## ADDITIONAL INFORMATION

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