

LETTER TO THE EDITOR

The impact of COVID-19 on related-donor allogeneic stem cell harvest processes: A British Society of Blood and Marrow Transplantation and Cellular Therapy survey

The British Society of Blood and Marrow Transplantation and Cellular Therapy (BSBMTCT) Registry collects and coordinates information on all haematopoietic stem cell transplantation (HSCT) activity in the UK and the Republic of Ireland. This includes details of peripheral blood and bone marrow stem cell harvest procedures, referred to as 'harvest' from here on, such as those required for related-donor allogeneic HSCT (allo-HSCT). In December 2019 the emergence of the coronavirus disease 2019 (COVID-19) pandemic led to major concerns about the potential impact of the virus on stem cell harvests. National and international registries underwent rapid policy adaptations to prepare for potential harvest cancellations due to donor availability, donor or patient illness and operational restrictions. The BSBMTCT therefore decided to capture details of all related-donor harvests that did not proceed as planned over a 12-month period from 1 April 2020 to 1 April 2021, capturing the first and second 'waves' of the COVID-19 pandemic in the UK. Data on unrelated-donor harvests are overseen by Anthony Nolan and therefore not included in this report.

A questionnaire (Appendix S1) was developed to answer the following research questions: (i) How many harvests did not proceed as planned? (ii) What were the reasons for this? (iii) What was the impact of COVID-19 on stem cell harvests? Questions were designed and reviewed by subject matter experts at the BSBMTCT Executive Committee to ensure validity. Surveys were sent in PDF and Microsoft Word® format to transplant programme directors and data management staff at all 32 adult and paediatric transplant centres performing related-donor allo-HSCTs in the UK. Centres were asked to return data as scanned forms. To increase the number of responses, four individualised reminders were sent to non-responding centres. No financial remuneration was provided. The data collection period spanned 12 months from 1 April 2020 to 1 April 2021 and complied with General Data Protection Requirements (GDPR) requirements.

The survey achieved a response rate of 94% (30/32) for questionnaire return with all responders answering all individual questions relevant to them. Selection of multiple answer options was possible in questions exploring donations described as 'failed due to COVID-19' in more detail. Centres reported 429 planned donor-related stem cell harvests of

which 15 (3%) did not take place. Four responding centres reported no failed donations over the study period.

There were 15 failed harvests from six matched sibling, five matched other relative and four mismatched relative donors. Of the 15 failed harvests, seven (47%) were reported to be due to COVID-19. This was due to positive COVID-19 swab in the donor (two of seven), recipient (two of seven) or household contact (one of seven), or due to suspension of all non-urgent procedures at the responding centre (two of seven). Symptoms of COVID-19 were reported in two of seven of the harvests that did not proceed due to COVID-19. The remaining eight failures were due to a change in patient condition (four of eight), donor failure to mobilise (two of eight) or procedural failure due to clotting or toxicity (two of eight). None of the harvests were cancelled due to personal reasons.

When considering the timing of the failed harvest in context of stem cell mobilisation, there were nine failures before starting granulocyte-colony stimulating factor (G-CSF; nine of 15) with four failures after starting G-CSF (four of 15). Two donors were planned to undergo bone marrow harvest and therefore did not require mobilisation (two of 15). None of the four cancellations after starting G-CSF were COVID-19 related. Figure 1 illustrates whether transplant occurred following initial harvest failure. Of the seven harvests that did not occur as planned due to COVID-19, four proceeded at a later date and resulted in transplant. Of the eight harvests that failed for reasons other than COVID-19, seven resulted in transplant at a later date (six with the same donor, one with a different donor). The median (range) length of postponement was 144 (35–291) days for COVID-19-related delays and 68 (2–277) days for non-COVID-19 delays.

Four harvest procedures, and subsequent transplants, were abandoned all together. Three of these were COVID-19 related, with patient outcomes described as 'disease progression' (two of three) and 'no further treatment – patient had COVID-19' (one of three).

Stem cell donation failures are a known challenge for transplanting physicians and donation centres and are well reported in the literature.¹ While reasons for harvest procedure cancellation are not always clearly reported to registries, evidence suggests that many of these are caused by

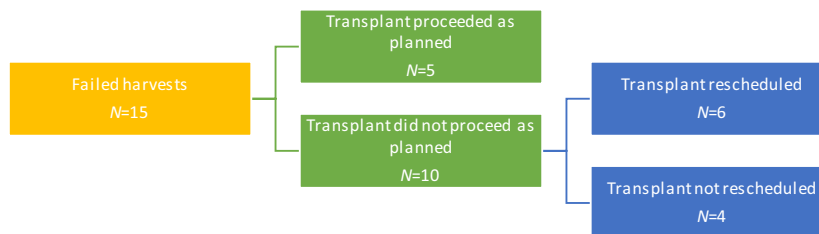


FIGURE 1 Transplant occurrence following initial cancellation of the harvest procedure.

poor donor mobilisation,^{2–4} toxicities associated with the mobilisation regimen,⁵ inability of undergo bone marrow harvest or donor personal reasons.^{5,6} Takahashi et al.⁷ report harvest procedure cancellation rates of 1.2% in their large cohort of donor-related bone marrow and peripheral stem cell donations, while an older study assessing cancellations in unrelated donors conducted between 1987 and 2002 reports donor-related cancellation rates of 9.2%.¹ Our study reports delays or cancellation of stem cell harvest procedures in related donors, irrespective of plans for cryopreservation, during the first and second waves of the COVID-19 pandemic in the UK of 3%. While no other recent UK data have been published, this appears to be an acceptable level of cancellations, especially considering the ongoing COVID-19 pandemic, and well within published experience prior to the viral pandemic. The absence of any obvious increase of delayed stem cell harvests may reflect the rapid introduction and adoption by centres of the BSBMTCT and National Institute for Health and Care Excellence (NICE) Guidelines in response to the COVID-19 pandemic.^{8,9}

Our survey, investigating related-donor source stem cell donation processes at UK centres during the COVID-19 pandemic, demonstrates acceptable rates of delays and cancellations. While some cancellations, e.g., due to late diagnosis of COVID-19, will remain unavoidable, rapid adaptation of required policies, optimisation of COVID-19 screening processes and ongoing learning from the pandemic will allow further streamlining of our approaches in the future.

AUTHOR CONTRIBUTION

Kim Orchard, Rachel Pearce and Julia Lee designed the questionnaire; Julia Lee and Marie Wilson distributed the questionnaire, liaised with responders, and collated the data; Rachel Pearce and Julia Wolf analysed the dataset and Julia Wolf wrote the manuscript; all authors interpreted the findings and reviewed and approved the manuscript.

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CONFLICTS OF INTEREST

The authors have no competing interest to declare.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

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