Supplementary Methods

Statistical Analyses

Time-to-event outcomes:
- Post-transplant survival: time from first HSCT to death due to any cause;
- Non-relapse mortality (NRM): time from first HSCT to death due to any cause without prior relapse;
- Relapse: time from first HSCT to relapse or death related to relapse;
- Overall survival (OS): time from randomization to death due to any cause.

Probabilities of post-transplant survival and OS were estimated using the Kaplan–Meier method, and arms were compared by the log rank test (two-sided $P$-values presented). Hazard ratios (HRs) were calculated using the Cox proportional hazards model. Cumulative incidence rates of NRM and relapse were estimated adjusted for the competing risk of relapse or relapse-related death for the NRM analysis, and death unrelated to relapse for the relapse analysis. Subdistribution HRs were calculated based on Fine and Gray [1], and arms were compared by Gray’s test (two-sided $P$-values presented). The data cutoff date for these outcome measures was 30 April 2013.

Reference

1. Fine JP, Gray RJ. A proportional hazards model for the subdistribution of a competing risk. *J Am Stat Assoc.* 1999; 94: 496–509.
| Table S1. Baseline and transplant characteristics |
|-----------------------------------------------|
| $n$ (%)$^a$ | GO arm $n = 32$ | Control arm $n = 53$ |
| **Baseline characteristics** |
| Age, median (range), years | 60 (51–67) | 59 (50–69) |
| Male | 15 (46.9) | 24 (45.3) |
| ECOG performance status |
| 0 | 13 (40.6) | 20 (37.7) |
| 1 | 17 (53.1) | 29 (54.7) |
| 2 | 2 (6.3) | 4 (7.5) |
| European LeukemiaNet risk$^b$ |
| Favorable/intermediate | 20 (62.5) | 38 (71.7) |
| Poor/adverse | 9 (28.1) | 13 (24.5) |
| Unknown | 3 (9.4) | 2 (3.8) |
| Cytogenetics$^c$ |
| Favorable | 0 | 1 (1.9) |
| Intermediate | 25 (78.1) | 37 (69.8) |
| Unfavorable | 4 (12.5) | 11 (20.8) |
| Unknown | 3 (9.4) | 4 (7.5) |
| **Transplant characteristics$^d$** |
| Time from last GO dose to transplant, median (range), days$^e$ | 222 (64–1215) | 121 (52–753) |
| Timing relative to last GO dose$^f$ |
| <2 months | 0 | 1 (1.9) |
| ≥2 months | 31 (96.9) | 7 (13.2) |
| Timing of transplant relative to EFS event$^g$ |
| In first complete remission | 17 (53.1) | 22 (41.5) |
| After relapse | 13 (40.6) | 22 (41.5) |
| After induction failure | 2 (6.3) | 9 (17.0) |
| Disease status at time of transplant |
| In complete remission | 27 (84.4) | 46 (86.8) |
| Not in complete remission | 3 (9.4) | 6 (11.3) |
| Transplant type |
| Allogeneic | 32 (100) | 52 (98.1) |
| Autologous | 0 | 1 (1.9) |
|                        | GO arm | Control arm |
|------------------------|--------|-------------|
| **n (%)**              |        |             |
| **Donor relatedness**  |        |             |
| Related                | 10 (31.3) | 23 (43.4) |
| Unrelated              | 20 (62.5) | 27 (50.9) |
| Unknown                | 2 (6.3) | 3 (5.7) |
| **HLA compatibility**  |        |             |
| Matched                | 27 (84.4) | 44 (83.0) |
| Unmatched              | 2 (6.3) | 4 (7.5) |
| Unknown                | 3 (9.4) | 5 (9.4) |
| **Donor relatedness/HLA compatibility** | | |
| Matched/related        | 9 (28.1) | 23 (43.4) |
| Alternative donor      | 19 (59.4) | 24 (45.3) |
| Unknown                | 4 (12.5) | 6 (11.3) |
| **Stem cell source**   |        |             |
| Bone marrow            | 7 (21.9) | 18 (34.0) |
| Peripheral blood       | 20 (62.5) | 29 (54.7) |
| Cord blood             | 4 (12.5) | 4 (7.5) |
| Unknown                | 1 (3.1) | 2 (3.8) |
| **Conditioning type**  |        |             |
| Myeloablative          | 5 (15.6) | 9 (17.0) |
| Reduced intensity      | 25 (78.1) | 40 (75.5) |
| Unknown                | 2 (6.3) | 4 (7.5) |
| **Conditioning regimen included busulfan + fludarabine** | 14 (43.8) | 29 (54.7) |
| **Conditioning regimen included busulfan + cyclophosphamide** | 2 (6.3) | 6 (11.3) |

*Unless otherwise noted

*Risk status based on 2010 guidelines [2]*

*Cytogenetic classification was defined as follows:

*Favorable* included inv(16)/(t(16;16) and t(8;21);

*Unfavorable* included monosomy 5 or del(5q), monosomy 7 or del(7q), t(6;9), t(9;22), 3q26 abnormalities except t(3;5), 11q23 abnormalities except t(9;11), and complex karyotypes with ≥3 abnormalities;

*Intermediate* included all other anomalies as well as normal karyotypes (karyotype classified as normal when ≥20 mitoses without chromosomal anomalies were observed in bone marrow specimens)

*Data based on first HSCT and conditioning regimen

*Eight patients in the control arm received GO as follow-up therapy prior to HSCT

*One patient in the GO arm received HSCT but not GO

*Patients who received transplant after relapse or induction failure could have achieved subsequent complete remission prior to transplant
ECOG Eastern Cooperative Oncology Group, EFS event-free survival, GO gemtuzumab ozogamicin, HLA human leukocyte antigen, HSCT hematopoietic stem cell transplantation

Reference
2. Dohner H, Estey EH, Amadori S, Appelbaum FR, Buchner T, Burnett AK et al. Diagnosis and management of acute myeloid leukemia in adults: recommendations from an international expert panel, on behalf of the European LeukemiaNet. Blood. 2010; 115: 453–474.
Table S2. Summary of VOD/SOS events after HSCT or conditioning

| Treatment arm | Timing of VOD/SOS | VOD/SOS grade | Outcome | Transplant type | Timing of HSCT / Disease status at HSCT | Stem cell source | Conditioning intensity / Regimen | Time between last GO dose and VOD/SOS | Time between HSCT and VOD/SOS |
|---------------|-------------------|---------------|---------|----------------|-----------------------------------------|-----------------|---------------------------------|-------------------------------------|---------------------------|
| 1 GO<sup>a</sup> | After 2nd HSCT    | 3             | Recovered | Allogeneic     | In CR1 / In CR1                          | Cord blood      | Reduced intensity / Cyclophosphamide | 9 months<sup>b</sup>                      | A few days                 |
| 2 GO          | After conditioning| 4             | Died before VOD/SOS resolved | Allogeneic | After relapse / In later CR | Peripheral blood | Reduced intensity / Fludarabine and busulfan | 301 days | N/A                        |
| 3 Control<sup>c</sup> | After HSCT       | 3             | Recovered | Autologous     | After relapse / In later CR | Peripheral blood | Myeloablative / Busulfan and cyclophosphamide | 75 days | 25 days                    |

<sup>a</sup>Patient had two VOD/SOS events, one prior to first HSCT and one after second HSCT. Second HSCT and second VOD/SOS event described here

<sup>b</sup>After last dose of chemotherapy. GO was discontinued following induction due to first occurrence of VOD/SOS

<sup>c</sup>Patient received GO as follow-up therapy in combination with cytarabine after relapse

CR complete remission, GO gemtuzumab ozogamicin, HSCT hematopoietic stem cell transplantation, VOD/SOS veno-occlusive disease/sinusoidal obstruction syndrome
**Table S3. Summary of VOD/SOS events before HSCT**

| Treatment arm | Grade | Outcome     | Time between last GO dose and VOD/SOS |
|---------------|-------|-------------|---------------------------------------|
| 1 GO\(^a\)    | 3     | Recovered   | 10 days                               |
| 2 Control\(^b\) | 4     | Recovered\(^c\) | 49 days                               |
| 3 GO           | 2     | Recovered\(^d\) | ~28 days                               |

\(^a\) Patient had two VOD/SOS events, one prior to HSCT and one after second HSCT. GO was permanently discontinued after the first event, described here.

\(^b\) Patient received GO as follow-up therapy.

\(^c\) Patient received HSCT on 13 June 2013 and was still alive as of the 1 November 2013 retrospective data collection cutoff date.

\(^d\) Patient was still alive ~48.3 months after HSCT.

*GO* gemtuzumab ozogamicin, *HSCT* hematopoietic stem cell transplantation, *VOD/SOS* veno-occlusive disease/sinusoidal obstruction syndrome.
Fig. S1 Post-transplant survival in patients receiving transplant (A) in first complete remission or (B) after relapse/primary induction failure.

Median OS, mo (95% CI)  

A

GO | NE (12.6–NE) 52.9 (27.6–73.0)  
Control | 19.2 (5.9–NE) 45.5 (24.4–64.3)

HR 0.71 (95% CI: 0.29–1.74)  

B

GO | 14.5 (0.9–28.1) 21.0 (3.6–48.1)  
Control | 10.5 (5.3–NE) 44.3 (25.8–61.2)

HR 1.42 (95% CI: 0.64–3.14)

No. at risk:

A

GO | 17 16 15 14 11 11 11 9 8 6 5 5 3 3 3 1 0  
Control | 22 19 16 15 14 12 11 10 10 8 5 3 3 1 1 0

B

GO | 15 11 9 7 6 4 4 3 3 2 2 1 1 1 0  
Control | 31 24 19 15 14 13 11 10 7 5 4 4 4 2 2 0

CI confidence interval, GO gemtuzumab ozogamicin, HR hazard ratio, NE not estimable, OS overall survival