# Abstract: P1267

# Title: DROPLET DIGITAL PCR IMPROVES DETECTION OF ACUTE MYELOID LEUKEMIA RELAPSE POST BONE MARROW TRANSPLANTATION

**Abstract Type: Poster Presentation**

**Session Title: Stem cell transplantation - Clinical**

**Background:**

Allogeneic stem cell transplantation is a potentially curative treatment of acute myeloid leukemia (AML)[1], but relapse occur in 25-30% of transplanted patients[2]. Measurable residual disease techniques (MRD) allow for relapse prediction offering a time window to intervene[3]. Quantitative PCR (qPCR) is the golden standard in MRD, but high-quality markers are available in only ≈50% of patients. Droplet digital PCR (ddPCR) is a sensitive platform allowing for patient specific mutation detection. Previous studies suggest that a wider range of mutations can be used as MRD targets post transplantation due to the eradication of clonal hematopoiesis.

**Aims:**

The aim of this study was to investigate strengths and limitations of ddPCR in AML post transplantation.

**Methods:**

We retrospectively studied blood and bone marrow from AML patients transplanted at Aarhus University Hospital, 2008-2022. Next generation sequencing was performed on diagnostic samples. Paired analyses of qPCR vs ddPCR were performed and compared with Wilcoxon Signed Rank Test.

**Results:**

48 ddPCR assays were designed and validated with a median sensitivity of 0,0081 % mutation allele frequency. Two assays were excluded due to low performance. The applicability of ddPCR, qPCR on NPM1-mutation, qPCR on WT1-overexpression, and qPCR on fusion transcripts were 92.9%, 40.5%, 38.1%, and 4,8%, respectively.

28 patients with relapse were included as cases. Paired analysis of ddPCR vs NPM1 (qPCR) (n=9) revealed 29.1 days longer lead time of NPM1 (qPCR) compared to ddPCR (p=0.03). Paired analysis of ddPCR vs WT1-overexpression (qPCR) (n=12) revealed 23.8 days longer lead time of ddPCR compared to WT1 (qPCR) (p=0.03). Seven relapsing AML patients with no established qPCR MRD marker were followed by ddPCR alone. Here, relapses were predicted by ddPCR in five of seven patients. The mean lead time across all seven patients were 121.6 days.

232 samples from 15 long-term remission patients were analysed as controls. False positive MRD-relapse were observed in 0, 0, 0, and 1 patient with ddPCR, qPCR on NPM1, qPCR on fusion transcript, and qPCR on WT1-overexpression, respectively.

**Summary/Conclusion:**

qPCR on NPM1 mutation or a fusion transcript remains the golden standard in post transplantation MRD monitoring. In remaining patients ddPCR is the strongest alternative with a high applicability and a significantly better lead time compared to qPCR on WT1-overexpression. ddPCR was safe in long-term remission patients even when monitoring mutations in genes such as DNMT3A, TET2 and ASXL2.

**References**

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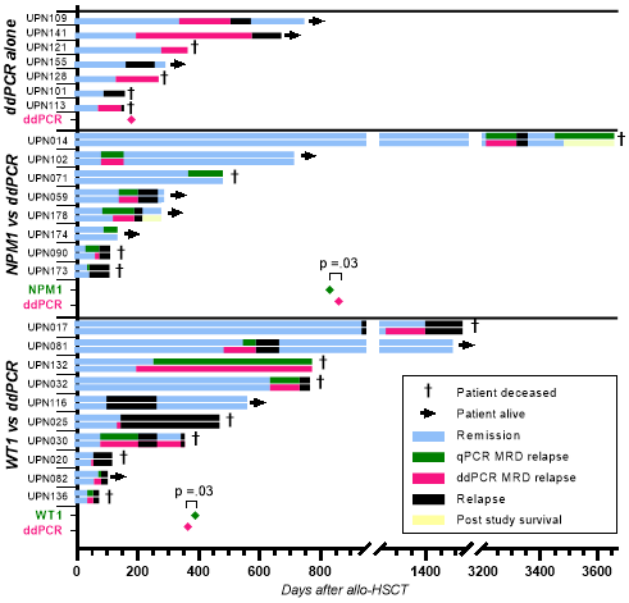


**Keywords:** MRD, Droplet Digital PCR (ddPCR), AML, Post-transplant