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ELEVENTH ANNUAL MEETING

Pure red cell aplasia in major abo-incompatible allogenic stem cell transplantation: retrospective analysis from a single-center experience

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INTRODUCTION

Pure red cell aplasia (PRCA) is a complication of major **ABO incompatibility (ABO-MM) allogeneic stem cell transplantation (alloHSCT)**.

PRCA is due to the **persistence of anti-donor isohemagglutinins** against bone marrow erythroid progenitors (BM-EP).

Evidence is lacking for PRCA incidence, optimal management, and prognosis.

AIM

To describe the characteristics of **PCRA** in a **homogeneous patient sample.**

METHOD

Retrospective review of patients receiving alloHSCT in our center between **2017 and 2021**, selected for those with suspected PCRA.

Inclusion criteria:

- Anemia (hemoglobin [Hb] <10 g/dL) with neutrophil- and platelet recovery (>1500/uL; >50.000/uL)
- BM-EP aplasia or hypoplasia (<20%) at day +21, +56, and +100
- Complete BM donor chimerism

Patients with **other causes of anemia were excluded**.

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RESULTS

Incidence*:* Among 454 allo-HSCT, 92 had ABO-MM (20.2%); 13 patients met PRCA inclusion criteria (**incidence of 14.1%** of ABO-MM allo-HSCT).

Five of this thirteen patients had been initially considered multifactorial anemia.

Incidence of PRCA in ABO-MM was 14.3%, 12.9%, and 15% for haploidentical, unrelated, and matched-related donor, respectively.

Characteristics of the sample and patients with PRCA in Table1-2.

Treatment (Figure 1): All patients but 1 received treatment based on erythropoietin, intravenous inmunoglobulins, rituximab and daratumumab.

Responses: 9/13 patients (76.9%), achieved **complete response** (Hb >10g/dl without transfusion) with first-line treatment after a median of 62 days (6-119).

No responses: Two patients died before resolution of PCRA due to relapsed AML (n=1) and acute GVHD (n=1).

BM-EP improved over 20% in 38.5% (day +56) and 54.5% (day +100) of patients

Donor's erythroid and serological ABO type: After a median of 3 months of therapy, 66.7% and 41.7% of patients respectively

Table 2. PCRA Characteristics

	+21	+56	+100
Hemoglobin median (g/dl)	9.8 (8.2-10.9)	9.1 (8-12.3)	9.6 (7.2-12.1)
Median of packet red blood cells (Between day +21 and +100)	8		
	AT DIAGNOSIS		
Median ferritin level	1349ng/ml		
Iron overload	6 (46.2%)		
Erythropoietin <500 U/L	6 (46.2%)		
Persistence of the patient's serological and erythrocyte ABO type (available in 11 patients)	9 (81.1%)		

Figure 1. Treatment

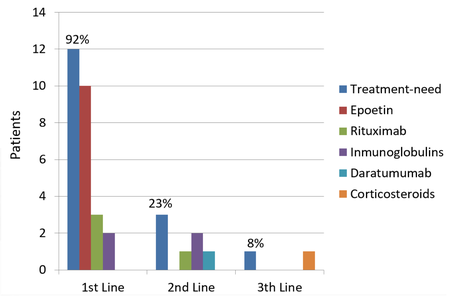


Table 1. Sample Characteristics

	ABO-MM allo-HSCT (n=92)		Allo-HSCT with PRCA (n=13)
Median age (range)	53 (17-71)		54 (17-68)
Sex (M/F)	41 (44,6%) / 51 (55,4%)		4 (30,8%) / 9 (69,2%)
Hematological disease	LMA 49 (53,3%)	LLC 2 (2,2%)	LMA 9 (69,2%)
	LLA 12 (13%)	LNH 8 (8,7%)	LLA 2 (15,4%)
	SMD 12 (13%)	LH 5 (5,4%)	SMD 1 (7,7%)
	SMP 3 (3,3%)	MM 1 (1,1%)	LNH 1 (7,7%)
Donor:			
-Identical sibling	40 (43,5%)		6 (46,2%)
-MUD 10/10	24 (26,1%)		3 (23,1%)
-MMUD 9/10	9 (9,8%)		1 (7,7%)
-Haplo	19 (20,7%)		3 (23,1%)
Source			
-Bone marrow	3 (3,3%)		-
-Peripheral Blood	89 (96,7%)		13 (100%)
Conditioning regimen			
AMA/RIC	47 (51,1%)/45 (49,9%)		6 (46,2%)/7 (53,8%)
ABO Rec/Don type			
-Receptor O	135 (70,3%): Don A 102; B 32; AB 1		12 (92%): Don A 10; B 2;
-Receptor A	34 (17,7%): Don B 20; AB 14		1(7,7%): Don AB
-Receptor B	23 (12%): Don A 14; AB 9		----
Bidirectional ABO-MM	34 (17,7%)		0 (0%)

MUD: Matched inrelated donor; MMUD: Missmatched unrelated donor; AMA: Myeloablative conditioning; RIC: Reduced intensity conditioning; AML: Acute myeloid leukemia; ALL: Acute lymphoblastic leukemia; MDS: Myelodysplastic syndrome; MPS: Myeloproliferative syndrome; CLL: Chronic lymphocytic leukemia. NHL: Non-Hodgkin's lymphoma; HL: Hodgkin's lymphoma; MML: Multiple myeloma.; Don: Donor.

CONCLUSIONS

1. Our results are in line with previously published, although variability in inclusion criteria leads to disparity of results.
2. We have demonstrated than PRCA can be underdiagnosed in some cases.
3. In our center, the most used treatment was erythropoietin followed by Rituximab and intravenous inmunoglobulins. The majority of patients achieved a satisfactory response.
4. Given the low incidence of this complication, multicentre studies are needed to better characterize PRCA and its risk factors.

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