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BACKGROUND-AIM

- Blood transfusions constitute an important therapeutic intervention that follow strict protocols.
- Data on the epidemiology of pediatric transfusions in Greece and worldwide are sparse.
- Our aim was to capture data regarding the practices and safety of blood transfusions in children in Greece.

This work was conducted by Dr Maria Giouleka, as a thesis for the Postgraduate Master of Science program: "Pediatric and Adolescent Hematology-Oncology", Medical School University of Crete, Heraklion

MATERIALS - METHODS

- Retrospective observational study of transfusions the Departments of Pediatrics and Pediatric surgery.
- 5-year study: 01.01.2017-31.12.2021.
- Demographic/clinical data were retrieved through the hospital's electronic system of blood orders (BloodLab) and the electronic patient records (EPR & SAP).
- Patients hospitalized in the Neonatal Intensive Care Unit were not included in the analysis.

- Data recorded:** age, gender, reason for admission, indication for transfusion, blood product transfused (PRC, PLT, FFP, cryoprecipitate), Hb before/after the transfusion (for PRC), time of transfusion (relation with working hours), adverse events (AE), management of AE.
- Comparison between patients of the two departments (**Pediatrics** vs. **Pediatric Surgery**) [SPSS,v.27.0].

Patients: **148**

Transfusions: **220**

RESULTS

Risk of AE: **X12 boys**

Risk of AE: **X9 PedSurg**

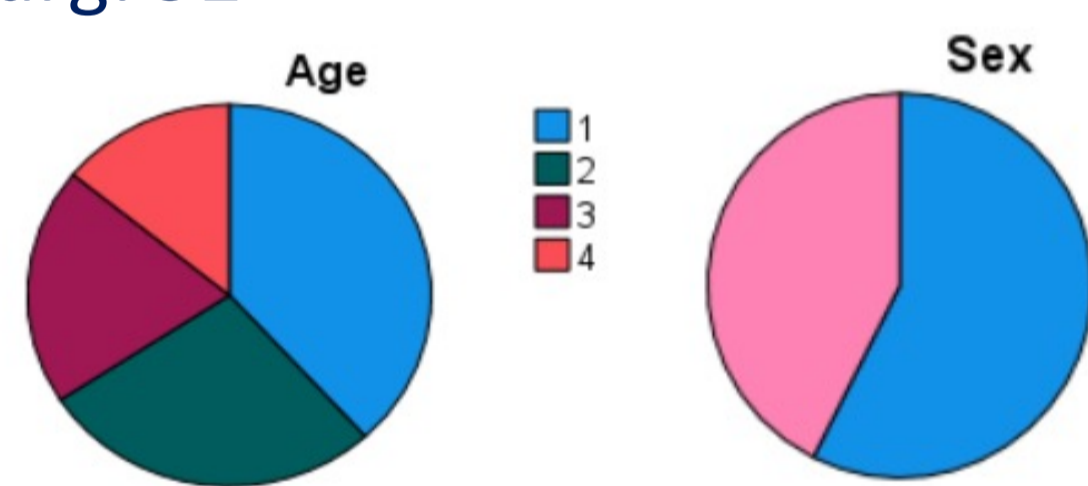
- **Total number** of transfused children between 01/2017- 12/2021: **148**

- **Gender:** 63 (42/6%) females και 85 (57.4%) males

- **Department:** Pediatrics: 56 - Ped Surg: 92

- **Age groups :**

- (1) 29 days 12 m: 57 (38.5%)
- (2) 1-4 yrs: 41 (27.7%)
- (3) 5-10 yrs: 29 (19.6%)
- (4) 11-16 yrs: 21 (14.2%)



• pRBC transfusions: **157 (71.4%)**

• Washed RBC : **6 (2.7%)**

• FFP transfusion: **27 (12.3%)**

• PLT transfusion : **30 (13.6%)**

✓ **Transfusions in Pediatrics Dept : 99**

✓ **Transfusions in Ped Surg Dept : 116**

✓ **Transfusions in Operating theatre or Resus area: 5**



Demographic and clinical characteristics of the patients and transfusion-associated information		
Sex	N	%
Males	85	57.4
Females	63	42.6
Age		
29 days-12 months	57	38.5
1-4 years	41	27.7
5-10 years	29	19.6
11- 16 years	21	14.2
Clinical Department		
Pediatric	56 (99)	37.8
Pediatric Surgery	92 (121)	62.2
Type of transfusion		
pRBCs	157	71.4
PLTs	30	13.6
FFP	27	12.3
Washed pRBCs	6	2.7
Time of transfusion		
Out of hours	126	57.3
Working hours	94	42.7
Occurrence of adverse event		
Yes	11	5.0
No	179	81.4
Not mentioned	30	13.6

Demographic and clinical characteristics of the patients and transfusion-associated information		
Diagnosis/ Indication of transfusion		
Pediatric Department		
Anemia (IDA, hemolysis, prematurity, other)	27	18.2
Coexisting infection	12	8.1
Cancer	12	8.1
Preparation for surgery	5	3.4
Pediatric Surgery Department		
Scheduled surgical intervention	25	16.9
Chest drain insertion	17	11.5
Trauma (including fractures)	12	8.1
Acute abdomen	11	7.4
Ileus- intussusception- volvulus	8	5.4
Hemorrhage	6	4.1
hemorrhage	4	2.7
Burns	4	2.7
Occurrence of adverse reaction/ event		
Yes	11	5.0
No	179	81.4
Not mentioned	30	13.6

Occurrence of adverse reactions/events depending on the type of blood component transfused				
Type of blood component transfused	Adverse reactions/ events			Total Tx
	Yes	No	Not documented	
pRBCs	10 (6.4%)	122 (77.7%)	25 (15.9%)	157
FFP	1 (3.7%)	22 (81.5%)	4 (14.8%)	27
PLTs	0 (0%)	29 (96.7%)	1 (3.3%)	30
Washed pRBCs	0 (0%)	6 (100%)	0 (0%)	6

Comparison of the percentage of transfusions performed at Hb >7 gr/dL between the two departments				
Hb value (gr/dL)	Department		Pearson X ²	P
	Pediatric (N=50)	Pediatric Surgery (N=94)		
<7	31 (62%)	3 (3.2%)	62.585	<0.001
≥7	19 (38%)	91 (96.8%)		

	Adverse reactions/events		Pearson X ²	P
	Yes (N=11)	No (N=179)		
Gender			5.021	0.025*
Boys	10 (13.5%)	64 (86.5%)		
Girls	1 (2%)	50 (98%)		
Age			2.457	0.483
29 days-12 months	4 (7.7%)	48 (92.3%)		
1-4 years	5 (13.5%)	32 (86.5%)		
5-10 years	2 (9.1%)	20 (90.9%)		
11- 16 years	0 (0%)	14 (100%)		
Department			6.001	0.014*
Pediatric	4 (1.2%)	84 (98.8%)		
Pediatric Surgery	10 (9.5%)	95 (90.5%)		
Time of transfusion			5.221	0.022*
Out of hours	10 (9.1%)	100 (90.9%)		
Working hours	1 (1.3%)	79 (98.8%)		
Year of transfusion			1.6223	0.805
2017	1 (3.7%)	26 (96.3%)		
2018	3 (7.5%)	37 (92.5%)		
2019	4 (8%)	46 (92%)		
2020	2 (6.3%)	32 (93.7%)		
2021	1 (2.6%)	38 (97.4%)		

• **Males: X 12** increased risk of AE in comparison to females (OR = 12.682, p = 0.024).

• **Ped Surg Dept: X 9** times odds of AE in comparison to Peds Dept (OR = 9.551, p = 0.046).

• **Transfusions out of hours : X 11** times increased risk of AE in comparison to working hours transfusions (OR = 11.156, p = 0.028).

• **Age: NOT** a significant factor for the occurrence of AE.

Differences in Hb levels of the two depts BEFORE the transfusion:

Hb significantly higher in PedSurg patients (8.75 vs 6.60 gr/dL) (p <0.001)

% of transfusions at Hb > 7 gr/dl between the 2 Depts :

Higher in PedSurg Dept (96.8% vs 38%)) (p <0.001)

CONCLUSIONS

- Blood transfusions in children are safe in our institution. However, significant differences regarding the indications and practices were noted between the two departments, partly due to the lack of clear guidelines regarding the threshold for blood transfusions.
- Documentation of the process and possible AE can be improved.
- Continuous education of all health care professionals is of utmost importance for the safety of blood transfusions in children, especially with regards to indications, adherence to protocols and hemovigilance.