Prevalence of anemia and iron deficiency in patients with pancreatic ductal adenocarcinoma (PDAC) initiating systemic therapy

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INTRODUCTION:

Anemia and iron deficiency (ID) are common findings and complications of therapy in cancer patients.

Limited data are available regarding the incidence and causes of anemia in patients with **PDAC**.

The aim of this study was to evaluate the incidence of anemia and the deficiency of micro-nutrients necessary for proper hematopoiesis

MATERIALS AND METHODS:

- A retrospective, single-center analysis of 82 patients diagnosed with PDAC were consecutively subjected to initiate systemic chemotherapy.
- Complete blood count, iron status, vitamin B12 and folate concentrations were assessed prior to the onset of systemic treatment.
- Study definitions can be found below (Table 1.)

RESULTS:

- ✓ 62 patients (75.6%) were qualified for palliative and 20 (24.4%) for adjuvant chemotherapy
- ✓ Anemia (hemoglobin <12 g/dl) was noted in 40.1% of patients, (43.5% in palliative and 30% in the adjuvant group)
- ✓ Iron deficiency was noted in 46% of patients (51.5% in palliative and 30% in the adjuvant group)
- ✓ FID occurred twice more often than AID constantly in every group (Picture 1.)
- ✓ Vitamin B12 and folate deficiency were rare findings (Table 1.)
- ✓ Interestingly, 33% of patients from the palliative group had elevated levels of vitamin B12, whereas in the adjuvant group it was not observed (Picture 2.)

Table 1.

Parameter	Group I (palliative)	Group II (adjuvant)	Total
Number of Patients n (%)	62 (75.6)	20 (24.4)	82
Age, median years (range)	66 (49-88)	67 (42-81)	66 (42-88)
Male/female n	24 /38	8 /12	32 /50
Anemia ^a n (%)	27 (43.5)	6 (30)	33 (40.2)
Mild anemia ^b n (%)	21 (25.5)	5 (25)	26 (31.6)
Moderate to severe anemia ^c n (%)	6 (9.7)	1 (5)	7 (8.4)
ID ^d n (%)	32 (51.5)	6 (30)	38 (46)
Absolute ID ^e n (%)	11 (17.6)	2 (10)	13 (15.8)
Functional ID ^f n (%)	21 (33.9)	4 (20)	25 (30.5)
Folic acid deficiency ^g n (%)	6 (9.7)	0	6 (7.2)
Vitamin B12 deficiency ^h n (%)	1 (1.7)	3 (15)	4 (4.9)
Vitamin B12, elevated ⁱ n (%)	20 (32.3)	0	20 (24.4)

^aAnemia: hemoglobin (Hb) <12 [g/dl] ^bMild anemia: Hb 10-11.9 [g/dl]

^cModerate to severe anemia : Hb <10 [g/dl]

^dIron Deficiency (ID) :Trasnferrin Saturation (TSAT) <20%

^eAbsolute Iron Deficiency (AID): Serum Ferritin (SF) <100 [ng/ml]

^fFunctional Iron Deficiency (FID) : TSAT <20%, SF >100 [ng/ml]

^gFolate deficiency : below laboratory standard ^hVitamin B12 :below laboratory standard ⁱ Vitamin B12: above laboratory standard

Picture 1. ID, anemia in PDAC patients

Picture 2. Vitamin B12 status

CONCLUSIONS:

- Anemia and ID are frequently noted in patients with PDAC before systemic therapy (Pic. 1.)
- B12/folate deficiency is a rare cause of anemia in PDAC (Pic. 2.)
- Iron status should be carefully assessed in the management of PDAC patients qualified for the chemotherapy.
- The importance of serum vitamin B12 elevation among patients with PDAC requires further research.