Associated factors with the megaloblastic character of macrocytic anemia

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INTRODUCTION

- Anemia: major public health problem.
- Macrocytic anemia is common in the elderly and megaloblastic anemia, caused by vitamin B12 or folate (vitamin B9) deficiency, is the most common cause.
- Confirmation of diagnosis :

  - bone marrow aspiration
  - vitamin B12 and B9 dosage

- Availability: Specialized centers

AIM

Study predictive factors of the megaloblastic character of macrocytic anemia

Patients and Methods

- A retrospective analytic descriptive study of patients followed for macrocytic anemia (January 2004 and December 2017)
- In the Internal Medicine and Hematology Departments, Monastir Tunisia

* A comparative study:
- Patients with megaloblastic anemia (group 1)
- Patients without megaloblastic anemia (group 2).

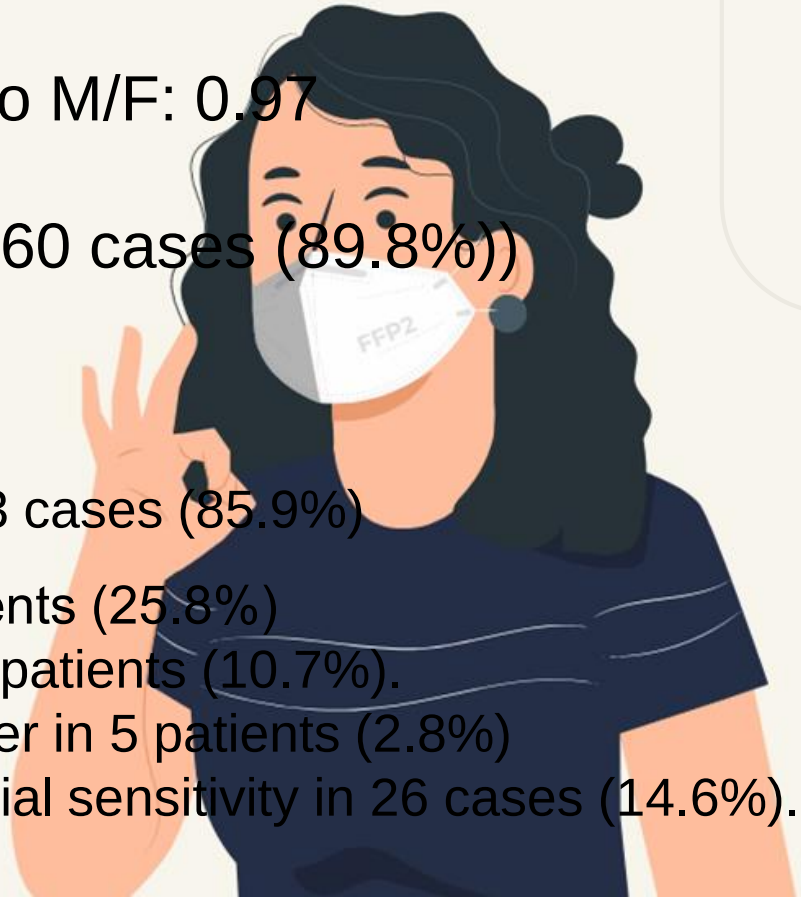
* Predictive factors of the megaloblastic character of anemia:
- univariate analysis.
- multivariate analysis.

1 - General characteristics of the studied population (178 Patients):

- Mean age: 60 years, Sex ratio M/F: 0.97
- Functional signs: Asthenia (160 cases (89.8%))
- Physical examination:

RESULTS

  - mucocutaneous pallor :153 cases (85.9%)
  - Hunter’s glossitis : 46 patients (25.8%)
  - Pyramidal syndrome in 19 patients (10.7%).
  - Profound sensitivity disorder in 5 patients (2.8%)
  - Abnormality of the superficial sensitivity in 26 cases (14.6%).



- Mean **Hemoglobin** level 6.8 ±2 g/dl (3 to 11.5 g/dl).
- Mean **MCV** level 112 ±10.5 fl (101 to 162 fl).
- **Pancytopenia** and **bicytopenia** 57 cases (32%) and 50 cases (28%) .
- **Blood smear**:hypersegmented PNN nuclei (40 % of cases).
- The mean **Lactic dehydrogenase level (LDH)** 950 UI/L (39 -10 170 UI/L).
- The average value of **aspirate transaminase (ASAT)** and **alanine transaminase (ALAT)** was 25 and 18 UI/L respectively.
- **Bone marrow aspiration** 137 cases (77%)

Etiologies of macrocytic anemia (178 patients):
- Megaloblastic anemia : 135 patients
-OTHERS (Myelodysplastic syndrome, Mixed deficiency anemia, Hypothyroidism, Multiple myeloma etc…) : 43 patients

	Patients with megaloblastic anemia (group1) (n=135)
Sex	
- **Males**	67 (49.6%)
- **Females**	68 (50.4%)
Age	59.3
Hunter's Glossitis	39 (88.6%)
Neurological manifestation	
-Pyramidal syndrome	
-Profoundsensitivity	19 (100%)
disorder	4 (80%)
-Superficialsensitivity	21 (87.5%)
disorder	
Hemoglobin < 8 (n) (%)	101 (82.11%)
➢ **8**	34 (72.3%)
Hemoglobin	6.69
MCV	114 fl
ASAT	41 UI
ALAT	28 UI
LDH	2140 UI/L

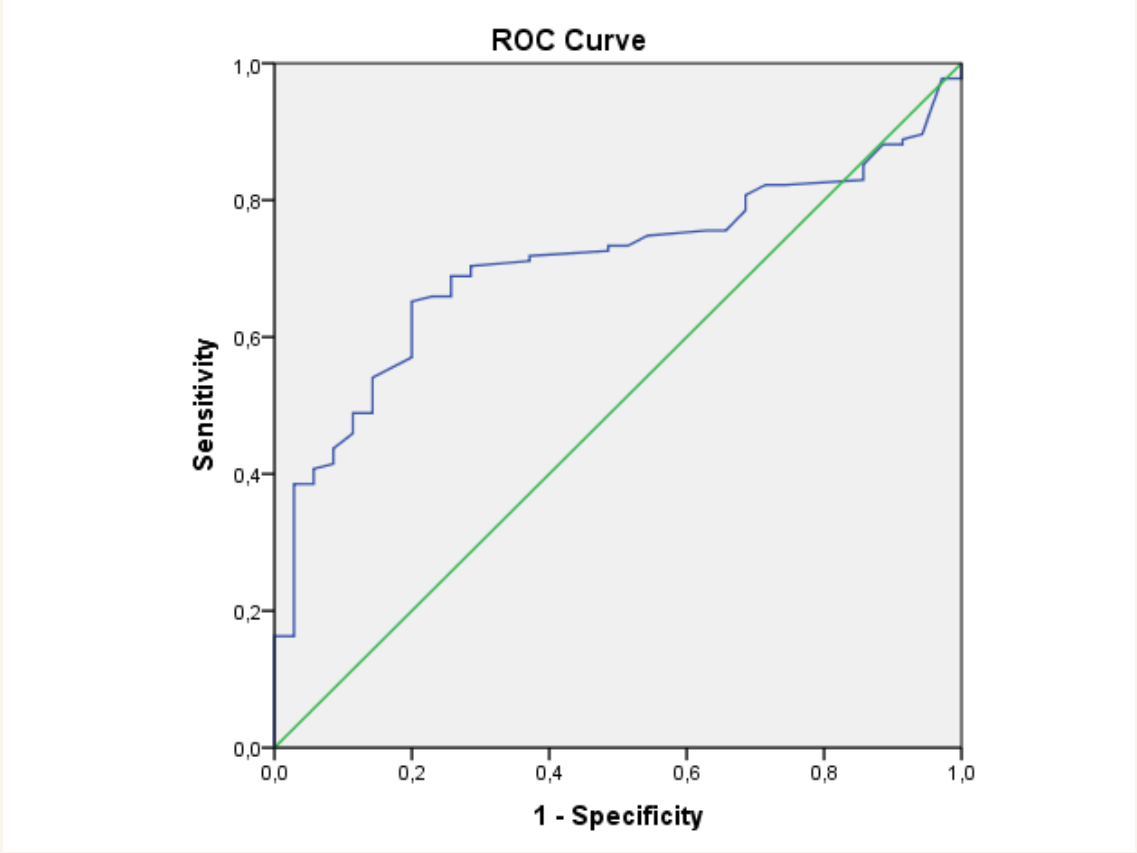
3/ PREDICTIVE FACTORS FOR MEGALOBLASTIC ANEMIA:

Multivariate analysis performed on this model showed that independent predictive factors for the megaloblastic character of macrocytic anemia were **LDH** (OR=1, 95% CI= 1.00- 1.001, p=0,033) and **MCV** (OR=1.075, 95% CI= 1.011- 1.143, p=0,021)

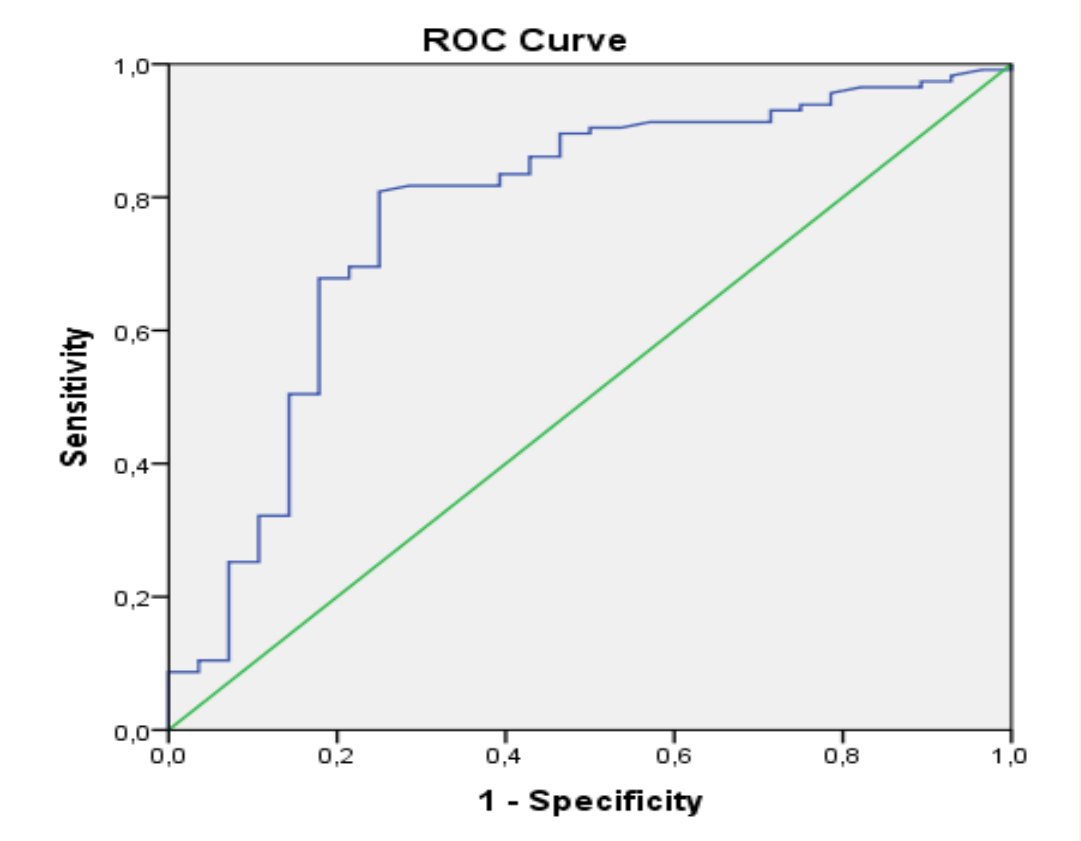
Variable	Odds ratio	95% CI	p value
LDH	1	1.000-1.001	0.033*
MCV	1.075	1.011-1.143	0.021*

CI: confidence interval; *p <0.05

- The value of MCV and LDH as predictors of the megaloblastic character of macrocytic anemia was studied using the area under the ROC curve which was 0.7 for MCV and 0.78 for LDH .
- A cut-off MCV level of 108.15 fl predicted the megaloblastic character of the anemia with a sensitivity of 70.3% and a specificity of 70.8%.
- A cut-off LDH level of 697.5 UI/L predicted the megaloblastic character of the anemia with a sensitivity of 85.1% and a specificity of 75%.



Receiver operating characteristic (ROC) curve for MCV for magaloblastic character prediction in patients with anemia; area under ROC curve 0.7.



Receiver operating characteristic (ROC) curve for LDH for megaloblastic character prediction in patients with anemia; area under ROC curve 0.78.

Discussion

- In the current study, predictive factors of megaloblastic anemia found in our cohort were LDH and MCV.
- Many studies have confirmed that megaloblastic anemia is associated with raised LDH levels in agreement with our results
- TS Jaswal et al concluded that total serum LDH levels exceeding 3000 UI/L are specific of megaloblastic anemia.

Conclusion

According to our results, we suggest that in patients with macrocytic anemia with high **MCV** levels exceeding **108.15 fl** and **LDH** levels over than **697.5 UI/L**, megaloblastic anemia can be diagnosed without needing a bone marrow aspiration and should be treated adequately.

THANK YOU FOR YOUR ATTENTION