

## Comparison Of Classical And Flow Cytometric Osmotic Fragility And Eosin-5-Maleimide Binding Test In The Diagnosis Of Hereditary Spherocytosis

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Hereditary spherocytosis is a type of hemolytic anemia, caused by hemolysis of erythrocytes prior to normal survival due to hereditary damage to erythrocyte membrane proteins. Disease; It is diagnosed based on family history, clinical findings, presence of spherocytes in peripheral smear and laboratory data. The most common routine laboratory test is osmotic fragility (K-OF). It has been reported that the sensitivity of the test was low and that the K-OF test with the incubated sample was more sensitive than the fresh sample. For this reason, many tests that work with different methods to replace the K-OF test are being developed. Recently, Eosin-5-maleimide binding test (EMA) and flow cytometric osmotic fragility test (FC-OF) that based on flow cytometry method have been developed.<sup>1-2</sup>

In our study, it was aimed to determine and compare disease severity and cut-offs of K-OF, EMA and FC-OF tests by using both fresh and incubated samples. The statistical findings are given in Table 1.

**Table 1.** Statistical Findings of K-OF, EMA and FC-OF Test.

Parameters	cut-off (Threshold Value)	AUC [% 95 CI]	P	Sensitivity [% 95 CI]	Specificity [% 95 CI]
K-OF (Fresh)	≤0,5	0,935 [0,828-0,985]	<0,0001	96,67 [82,8 – 99,9]	80,0 [56,3 – 94,3]
K-OF (Incubated)	≤0,7	1,000 [0,929-1,00]	<0,0001	100,0 [88,4 – 100,0]	100,0 [83,2 – 100,0]
EMA (Fresh)	>222,64	0,897 [0,778-0,965]	<0,0001	90,0 [73,5– 97,9]	85,0 [62,1 – 96,8]
EMA (Incubated)	>193,48	0,853 [0,725-0,937]	<0,0001	93,33 [77,9– 99,2]	75,0 [50,9 – 91,3]
FC-OF (Fresh)	>67,29	1,000 [0,929-1,000]	<0,0001	100,0 [88,4– 100,0]	100,0 [83,2 – 100,0]
FC-OF (Incubated)	>7,95	0,930 [0,821-0,983]	<0,0001	80 [61,4-92,3]	95 [75,1-99,9]

When the success of parameters in classification were compared, K-OF (Incubated)-EMA (Fresh) ( $p = 0.0397$ ), K-OF (Incubated)-EMA (Incubated) ( $p = 0.0211$ ), EMA (Fresh)-FC-OF (Fresh) ( $p = 0.0397$ ) and EMA (Incubated)-FC-OF (Fresh) ( $p = 0.0211$ ) were statistically significant, but there were no statistically significant difference in terms of other parameters.

**Keywords:** Hereditary spherocytosis, Flow cytometric osmotic fragility test, Eozin-5-Maleimid, EMA binding test, Osmotic fragility, Flow cytometry

### References:

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