Endotoxin activity assay: a biologic index to evaluate liver function during liver transplantation and a predictive index of post-transplant infections or post-transplant clinical complications.

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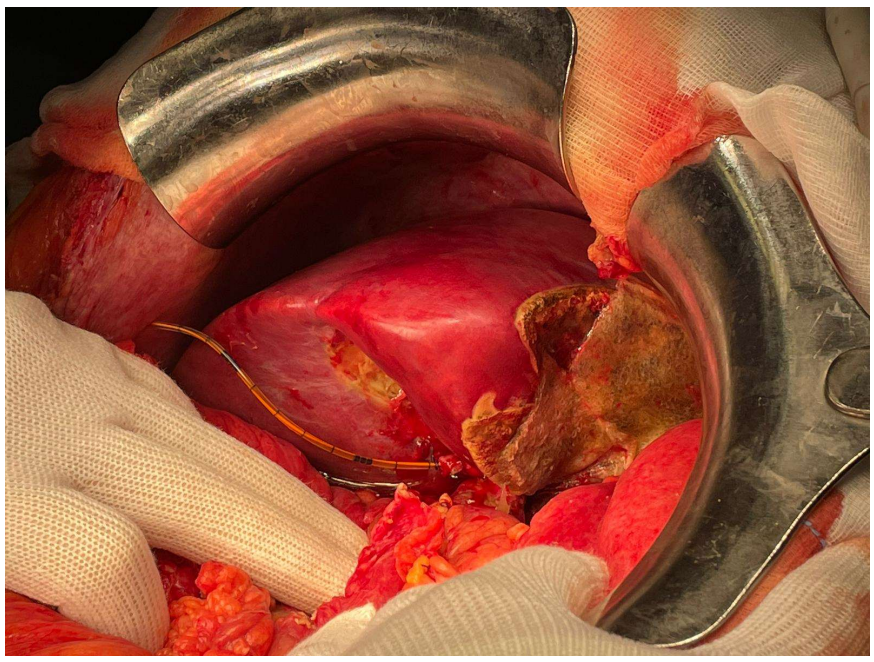
The Endotoxin Activity Assay (EAA) is a rapid in vitro diagnostic test that uses a specific monoclonal antibody to measure EA levels in EDTA whole blood specimens. EA value less than 0.40 is considered low level, between 0.40 and 0.60 intermediate level, and greater than 0.60 high level of activity. This assay triggers a specific reaction with lipopolysaccharide from Gram-negative bacteria, offering a direct assessment of endotoxin activity.

The hepatic reticuloendothelial system typically processes endotoxin present in portal venous blood. However, compromised liver function may lead to inadequate processing, potentially resulting in endotoxemia. This condition, exacerbated by cytokines, could significantly influence circulatory dynamics and contribute to ischemia-reperfusion injury during transplantation. Monitoring the kinetics of endotoxin in peripheral venous blood can thus serve as a valuable biological marker for assessing liver function.
For patients waiting for liver transplant, monitoring liver function (with instrumental and laboratory data) and the incidence of infections or other complications is essential. The same attention is requested post liver transplant to follow the clinical effectiveness of surgery and to validate these data as useful for graft prognosis.

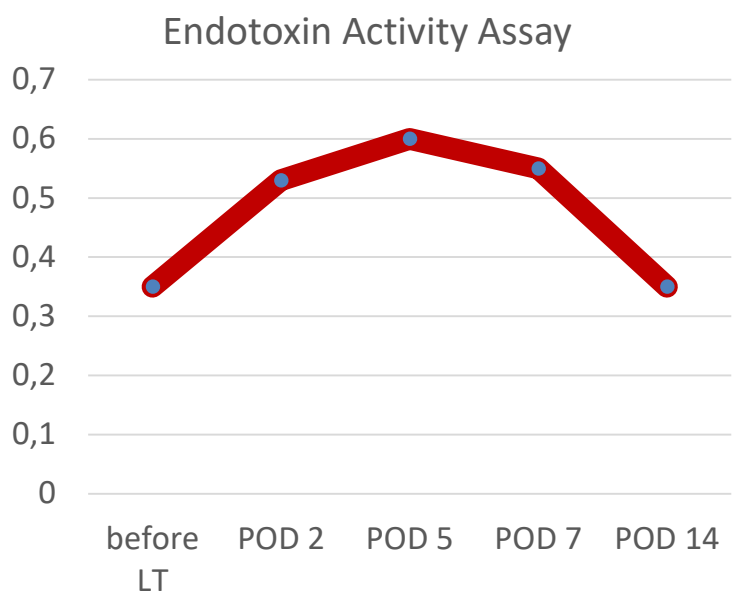
Our study aimed to explore endotoxin levels, assessed through the Endotoxin Activity Assay (EAA) in peripheral venous blood in the period between pre transplant hospitalization, transplant and post operative phase. We looked for a correlation between blood levels of endotoxin and the post transplant incidence of infections and complications with increased mortality and prolonged period of hospitalization. We measured the EA in perioperative peripheral venous blood, by EAA at 1 and 2 days before liver transplant, and on post operative days 2, 5, 7,14.



Img. 1 Liver Transplant.

	Before LT	2 POD	5 POD	7 POD	14 POD
EEA	0,35	0,43	0,6	0,55	0,35
AST	62	4966	276	115	64
ALT	37	2125	589	354	179
Bili tot/dir	20,65/13,18	4,3/2,72	3,97/2,67	6,9/5,94	8,4/6,86
INR	2,1	1,22	1,22	1,22	1,3
Ratio	1,95	0,96	0,87	0,87	0,96

Tab. 1



EEA's trend

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EAA Interpretation
 0.00 -  0.39 Low  EAA Level
 0.40 -  0.59 Mid  EAA Level
>=  0.60      High EAA Level
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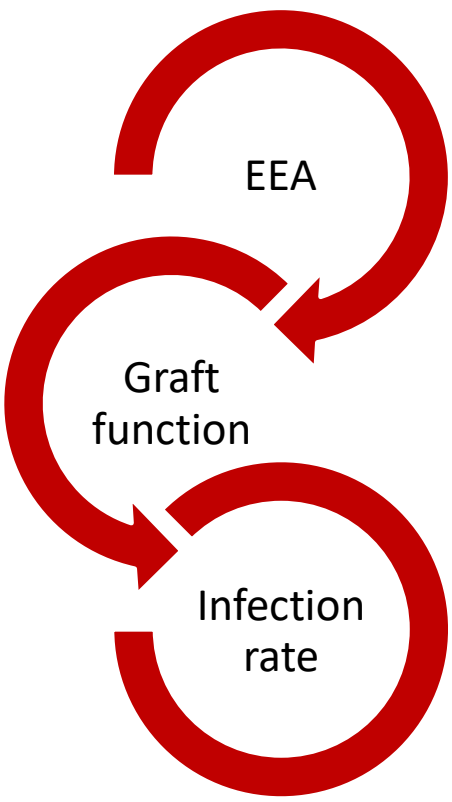
Img 2. EEA interpretation



In summary, monitoring preoperative EA level is useful to predict a high risk for post-transplant infections or complication. Persistent EA high level during post-transplant period is associated to infections but above all to high risk of graft disfunction.