



Variation of factor XIII level during pregnancy

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Introduction

Pregnancy alters the haemostatic system into a hypercoagulable state, which increases throughout pregnancy and is maximal around term. Most notably there is a significant change to coagulation, with increased factor VII, VIII, X and von Willebrand factor activity, marked increases in fibrinogen, and decreased activity levels of natural anticoagulants (protein C, protein S). Several studies evidenced a significant reduction of Factor XIII (FXIII) activity during the second and third trimester compared to first trimester in normal uneventful pregnancies. Aim of our study was to evaluate the variation of FXIII activity during the three trimesters to assess any similar decrease.

Methods & Materials

The study was conducted on a population of 20 healthy pregnant women (age 24-41, mean 32.8). The criteria of exclusion were deficiency of FXIII diagnosed before pregnancy, and antithrombotic therapy for any reason. All women were underwent laboratory evaluation at the first (T1), second (T2) and at third (T3) pregnancy trimester. Factor XIII activity was measured on BCS XP analyser using Berichrom FXIII reagent. Results was presented as mean \pm SD; the statistical analysis was evaluated by using Student's T test for paired data (p-value significant if less than 0.05).

Results

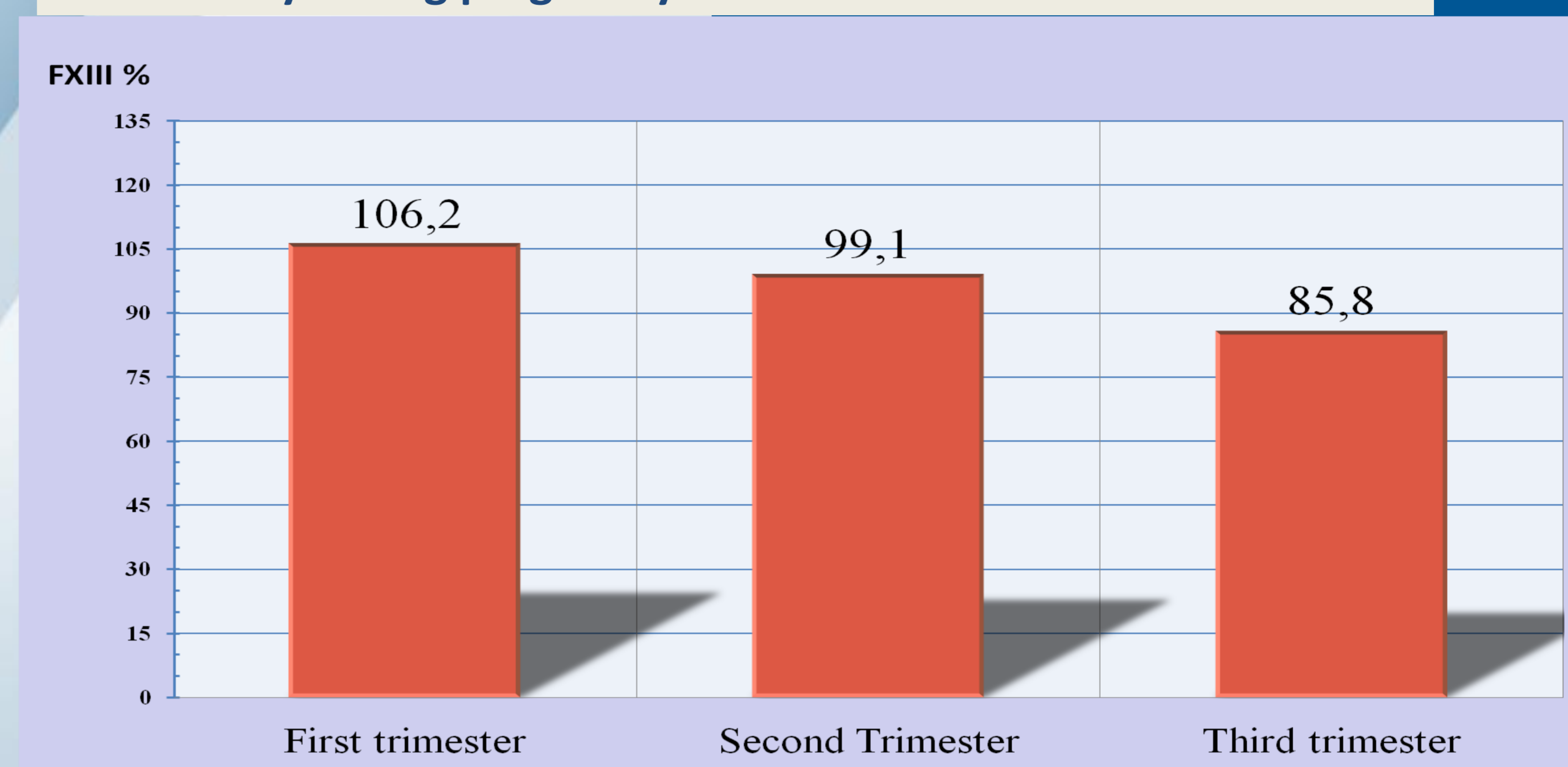
The mean FXIII activity was 106.2 ± 26.5 during first trimester, 99.1 ± 25.1 and 85.8 ± 26.7 during second and third trimester respectively. We have evidenced a statistically significant reduction of FXIII activity comparing the first to the third trimester (T1 vs T3, $p=0.02$), though the reduction was no statistically significant comparing the first trimester to the second one (T1 vs T2, $p=0.38$) and comparing the second trimester to the third one (T2 vs T3, $p=0.11$).

Conclusion

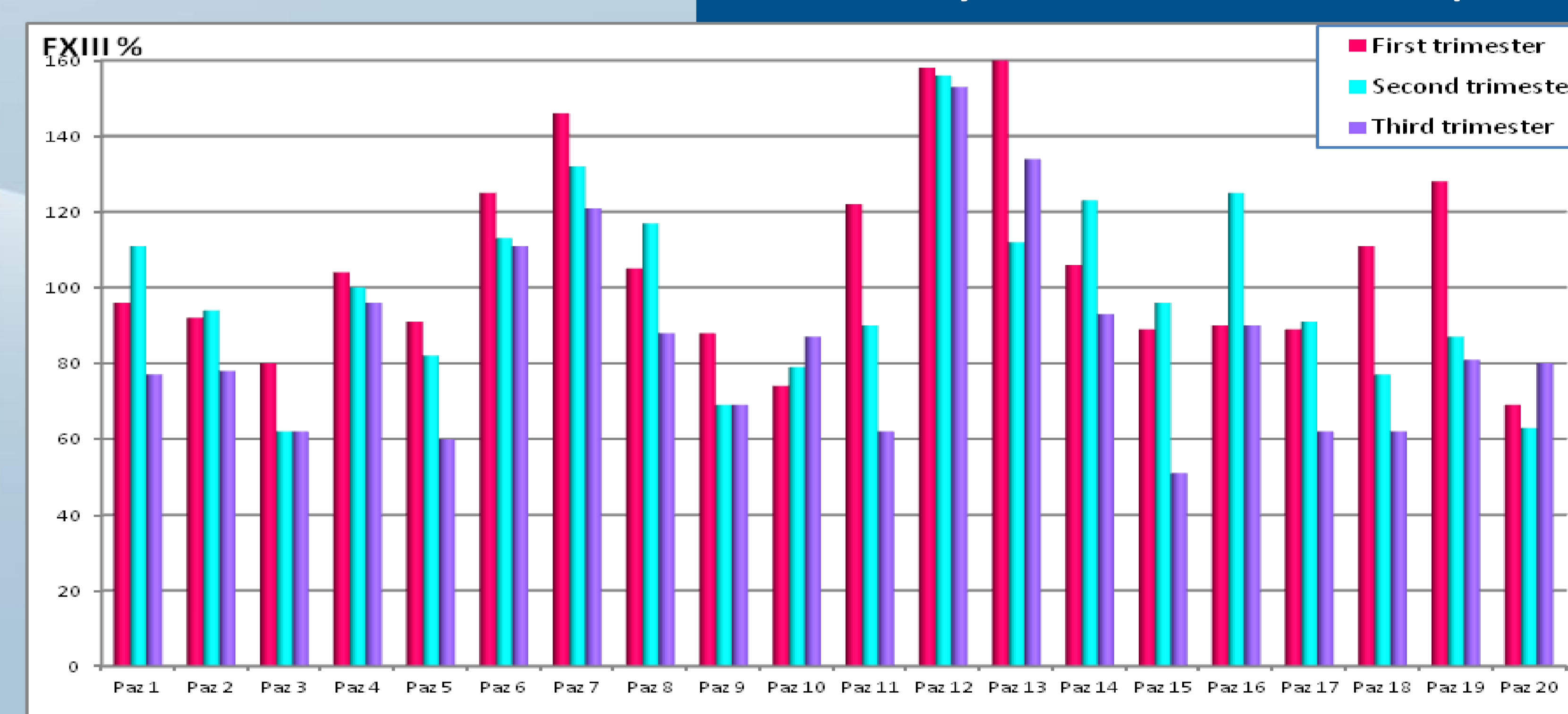
We have found a significant reduction only comparing the first trimester to the third one; the difference about what was observed so far could be due to the small number of studied patients. We think that large, controlled and comparative studies are needed to confirm FXIII reduction in pregnancy to avoid misdiagnosis and inappropriate use of fresh frozen plasma or FXIII concentrates for prevention or treatment in case of bleeding.

Pregnancy Trimester	Mean FXIII Activity
I Trimester (T1)	106.2 ± 26.5
II Trimester (T2)	99.1 ± 25.1
III Trimester (T3)	85.8 ± 26.7

FXIII activity during pregnancy trimesters



FXIII activity variation in the enrolled patients



FXIII activity in the enrolled patients			
	I Trimester	II Trimester	III Trimester
Pz. 1	96	111	77
Pz. 2	92	94	78
Pz. 3	80	62	62
Pz. 4	104	100	96
Pz. 5	91	82	60
Pz. 6	125	113	111
Pz. 7	146	132	121
Pz. 8	105	117	88
Pz. 9	88	69	69
Pz. 10	74	79	87
Pz. 11	122	90	62
Pz. 12	158	156	153
Pz. 13	160	112	134
Pz. 14	106	123	93
Pz. 15	89	96	51
Pz. 16	90	125	90
Pz. 17	89	91	62
Pz. 18	111	77	62
Pz. 19	128	87	81
Pz. 20	69	63	80

Pregnancy Trimester	Student T test results	Statistical Significance
T1 vs T2	$p=0.38$	NO
T2 vs T3	$P=0.11$	NO
T1 vs T3	$P=0.02$	YES

References:

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- 3) Karlsson O et al. A longitudinal study of factor XIII activity, fibrinogen concentration, platelet count and clot strength during normal pregnancy. Thromb Res. 2014 Sep;134(3):750-2

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