

# Calcium in third Trimester normal and EPH-Gestosis Pregnancy

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## Zusammenfassung

Bei nicht schwangeren Frauen haben Hypertoniestudien gezeigt, daß ein gestörter Calcium-Stoffwechsel zur Entstehung der Hypertonie beiträgt. Serum-Konzentrationen von totalem und ionisiertem Calcium wurden im 3. Trimenon bei 7 Frauen mit normal-verlaufender Schwangerschaft und bei 7 Frauen mit EPH-Gestose gemessen. Es zeigte sich kein signifikanter Unterschied zwischen den beiden Gruppen in den Serum-Konzentrationen des ionisierten Calciums. Es wurden nur Schwangere mit EPH-Gestose-Komplex in dieser Studie aufgenommen.

## Summary

In non pregnant women, studies of hypertension have shown that abnormal calcium metabolism contributes to the genesis of hypertension. We measured serum concentrations of total and ionized calcium in 7 third trimester normal and 7 EPH-Gestosis pregnant women. No significant difference could be demonstrated between the two groups in serum concentration of ionized calcium. Only pregnant women with EPH-Gestosis complex were used in this study.

## Résumé

Des études de l'hypertension menées chez des femmes non enceintes ont montré le rôle d'un métabolisme calcique anormal dans la pathogénie de cette affection. Nous avons mesuré la calcémie totale ainsi que le taux sérique de calcium ionisé lors du troisième trimestre de la grossesse chez sept femmes dont la grossesse se déroulait normalement et chez sept femmes présentant une toxémie gravidique. Le taux sérique de calcium ionisé n'a pas différé entre ces deux groupes. Cette étude n'a inclus que des femmes présentant la triade du syndrome «EPH-gestosis» (oedèmes, protéinurie, hypertension artérielle).

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## Introduction

Studies on calcium metabolism and hemostasis during normal pregnancy and in non pregnant women have been published and documented by many authors [1, 3, 5, 7].

There are however also very few reports of calcium metabolism and hemostasis during oedema-proteinuria-hypertension-Gestosis. In this study we report about the alteration in calcium metabolism in EPH-Gestosis women and III. trimester normal pregnant women.

## Methods

A total of 21 patients were studied. Group I consists of  $n=7$  normal pregnant women in the III. trimester (Gestational age between 31–39 weeks). Groups II consisted of  $n=7$  with EPH-Gestosis (complex) pregnancy (Gestational age between 29–38 weeks). Group III consisted of  $n=7$  non pregnant women with regular menstruation cycle. Blood samples were drawn prior to treatment in the EPH-Gestosis (complex) women and in 7 normal III. trimester pregnant women and 7 non pregnant women.

Tab. 1: Serum ionized and total Calcium in III. trimester normal and Gestosis pregnancy (mean  $\pm$  SD)

Serum level	Normal Pregnancy $n = 7$	EPH-Gestosis $n = 7$	Non pregnant subject $n = 7$	p
Ionized Calcium (m Eq/l)	2.13 $\pm$ 0.12	2.09 $\pm$ 0.14	2.14 $\pm$ 0.11	NS
Total Calcium (m Eq/l)	4.61 $\pm$ 0.26	4.53 $\pm$ 0.35	4.56 $\pm$ 0.31	NS

Calcium concentration were measured using atomic absorption spectrophotometry. Ionized calcium level were determined within 30 minutes after collection using the NOVA II ionized calcium analyzer.

Routine statistical analysis using Student-t-test, Wilcoxon test were used. Data are expressed as mean  $\pm$  SD (Standard Deviation).

## Results

In our results shown in Table I, no significant difference between normal pregnant women, non-pregnant women and those with EPH-Gestosis (complex) in serum ionized calcium and also in total calcium levels were found.

## Discussion

The relationship between serum calcium in normal non hypertensive to hypertensive state still remain controversial. Calcium has been postulated to be important in the pathogenesis of hypertension due to its effect on membranes fluxes and intracellular levels [2]. *McCanon* [5] found low serum ionized calcium level

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in nonpregnant hypertensive patients. Our results showed no significant changes in EPH-Gestosis women. Also our results on total serum calcium do support the results of other authors who reported no differences in the levels from that of normotensive control patients or increased in hypertensive patients [4, 5]. Total calcium levels has been shown to be declining in normal pregnancy and parallels the declining albumine level [7]. *Pitkin* et. al. 1977/79 [6, 7] found also reduced ionized calcium concentration during pregnancy. A view not shared by *Reitz* et. al. 1977 [8] and *Forh-Andersen* et. al. 1981 [3], who reported an increase of ionized calcium level during pregnancy. Since our results were not matched according to gestational age no changes were demonstrable.

Since the number of patients studied are small and the studies on calcium metabolism in Edema-proteinuria-hypertension-Gestosis are few, more studies in this direction are still needed.

### Literature

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