# The Postnatal Effect of Serum Vitamin D Binding Protein on Serum Vitamin D Level

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## BACKRAUND

- It is not an uncommon situation that newborns have normal serum Ca, P, Mg, ALP, and PTH levels despite low vitamin D.
- Serum vitamin D binding protein (VDBG) may play a role for this situation.
- However, there is no any study investigated the relationship between serum vitamin D and VDBP in postnatal period.
- The aim of this study is to examine the relationship between serum vitamin D level and VDBP in neonates who have normal serum Ca, P, Mg, ALP, and PTH levels despite low vitamin D and investigate the effect on serum vitamin D level of prophylactic vitamin D dose (400 unite/day).

## MARERIALS AND METHODS

- Mothers and their newborn, whose serum Ca, P, Mg, ALP, and PTH levels were normal, were separated into two groups by their serum vitamin D level.

- Group A: Low vitamin D
- Group B: Normal vitamin D

- VDBP level was measured in both group.
- Mothers and their newborns in group A were given 400 unite/day vitamin D.
- Serum Ca, P, ALP, Mg, PTH, vitamin D, and VDBP levels in group A were re-measured on the postnatal 45-60th days.

## RESULTS

- Both group A and group B had 30 mother-newborn pairs.
- There was no difference between group A and B in terms of antropometric parameters of newborns.
- There was no difference between group A and B in terms of serum Ca, P, Mg, ALP, and PTH levels of mothers and their newborn, whereas mothers and their newborn in group A had significantly lower vitamin D (p= 0.000 and p=0.000, respectively) and higher VDBP (p=0.04 and p=0.004, respectively) (Table 1 and 2).
- On the 45-60th days, mothers' serum Ca and vitamin D levels significantly increased (p=0.000; p=0.000, respectively), whereas there was no difference in VDBP level (Table 3).
- On the 45-60th days, newborns' serum Ca and vitamin D levels significantly increased (p=0.000), however there was no difference in VDBP level (Table 4).
- A negative correlation was found between serum vitamin D level and VDBP in newborns (p<0.048, r=-0.239 and p<0.002, r=-0.401, respectively) (Figure 1).

Table 1. Mothers' Ca, P, Mg, ALP, PTH, vitamin D, and DVBP levels (mean±SD)

| | Group A | Group B | *p* |
|---|---|---|---|
| **Ca (mg/dl)** | 8,98±0,25 | 8,99±0,20 | 0.82 |
| **P (mg/dl)** | 3,35±0,35 | 3,240±0,42 | 0.27 |
| **Mg (mg/dl)** | 2,02±0,24 | 2,02±0,17 | 0.97 |
| **ALP (U/l)** | 152,97±33,04 | 159,67±31,46 | 0.45 |
| **PTH (pg/ml)** | 30,87±11,12 | 27,56±11,52 | 0.26 |
| **Vitamin D (ng/ml)** | 8,91±1,52 | 29,18±6,21 | 0.000 |
| **VDBP (µg/ml)** | 0,51±0,65 | 0,25±0,28 | 0.04 |

Table 2. Newborns' Ca, P, Mg, ALP, PTH, vitamin D, and DVBP levels (mean±SD)

| | Group A | Group B | *p* |
|---|---|---|---|
| **Ca (mg/dl)** | 9,25±0,86 | 9,69±0,59 | 0.057 |
| **P (mg/dl)** | 5,93±0,93 | 5,57±0,66 | 0.08 |
| **Mg (mg/dl)** | 2,12±0,31 | 2,26±0,32 | 0.089 |
| **ALP (U/l)** | 270,03±81,36 | 288,60±70,63 | 0.34 |
| **PTH (pg/ml)** | 31,06±9,98 | 28,65±9,80 | 0.35 |
| **Vitamin D (ng/ml)** | 9,07±1,19 | 30,99±8,12 | 0.000 |
| **VDBP (µg/ml)** | 0,69±0,46 | 0,33±0,45 | 0.004 |

Table 3. Mothers' Ca, P, Mg, ALP, PTH, vitamin D, and DVBP levels on the 45-60th days (mean±SD)

| | At the birth | Postnatal 45-60th days | *p* |
|---|---|---|---|
| **Ca (mg/dl)** | 8,98±0,25 | 9,56±0,52 | 0.000 |
| **P (mg/dl)** | 3,35±0,35 | 3,53±0,51 | 0.303 |
| **Mg (mg/dl)** | 2,02±0,24 | 2,20±0,26 | 0.08 |
| **ALP (U/l)** | 152,97±33,04 | 152,59±37,08 | 0.89 |
| **PTH (pg/ml)** | 30,87±11,12 | 27,76±12,04 | 0.13 |
| **Vitamin D (ng/ml)** | 8,91±1,52 | 31,28±8,53 | 0.000 |
| **VDBP (µg/ml)** | 0,51±0,65 | 0,56±0,54 | 0.86 |

Table 4. Newborns' Ca, P, Mg, ALP, PTH, vitamin D, and DVBP levels on the 45-60th days (mean±SD)

| | At birth | Postnatal 45-60th days | *p* |
|---|---|---|---|
| **Ca (mg/dl)** | 9,25±0,86 | 10,09±0,59 | 0.000 |
| **P (mg/dl)** | 5,93±0,93 | 5,94±0,79 | 0.97 |
| **Mg (mg/dl)** | 2,12±0,31 | 2,18±0,43 | 0.23 |
| **ALP (U/l)** | 270,03±81,36 | 287,90±89,70 | 0.39 |
| **PTH (pg/ml)** | 31,06±9,98 | 25,70±13,01 | 0.000 |
| **Vitamin D (ng/ml)** | 9,07±1,19 | 37,74±10,17 | 0.000 |
| **VDBP (µg/ml)** | 0,69±0,46 | 0,71±0,54 | 0.86 |

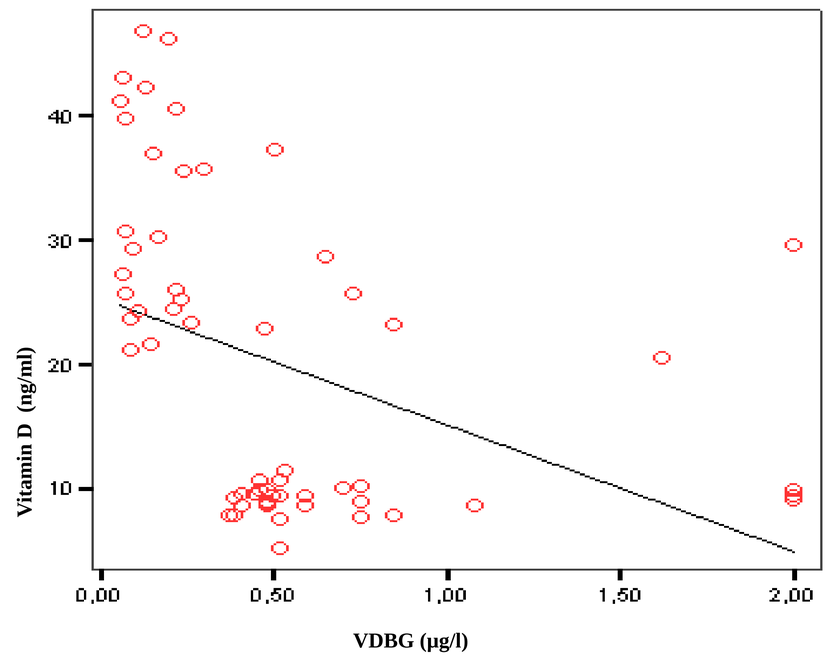


Figure 1. Correlation between serum vitamin D level and VDBP in newborns

## CONLUSION

- Serum Ca, P, Mg, ALP, PTH, and vitamin D levels should be evaluated carefully in both mother and their newborn.

- If serum Ca, P, Mg, ALP, and PTH levels are not consistent with vitamin D level, it should be kept in mind that this situation may be related to high VDBP level.

- In that case, prophylactic vitamin D dose should be preferred instead of high dose vitamin D therapy.

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