

Vitamin D status among Danish, pregnant women – the influence of nutritional and seasonal variations

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Background

Vitamin D in pregnancy

- Maternal vitamin D deficiency has been linked to preeclampsia, gestational diabetes, fetal growth restriction and preterm birth
- The main source of vitamin D is through skin exposure to solar ultraviolet B radiation
- 30-70% of the Danish population is believed to have low vitamin D status and obesity has been linked with low vitamin D
- In Denmark, all women are recommended a daily intake of 10 µg vitamin D throughout pregnancy
- At present, this recommendation do not consider variations in maternal body composition (BMI), dietary intake or circum-annual variations.

Aim

To estimate the prevalence of vitamin D among a cohort of pregnant women attending prenatal care at Randers Regional Hospital in Denmark, investigating if or how maternal vitamin D levels was affected by nutritional habits and circum-annual variations

Materials and methods

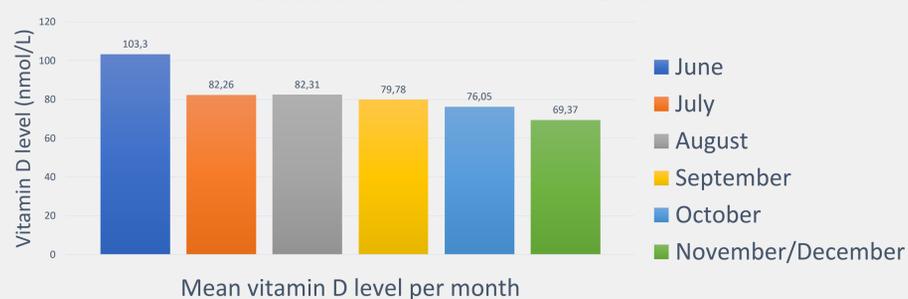
224 pregnant women were recruited when attending ultrasound examination at weeks 12-14 of gestation. Recruitment was done with informed consent between June and December 2016. All women completed a questionnaire regarding their health characteristics, lifestyle and habits. Blood samples was obtained and plasma-25-hydroxy vitamin D levels were analyzed using liquid chromatography mass spectrometry.

Results

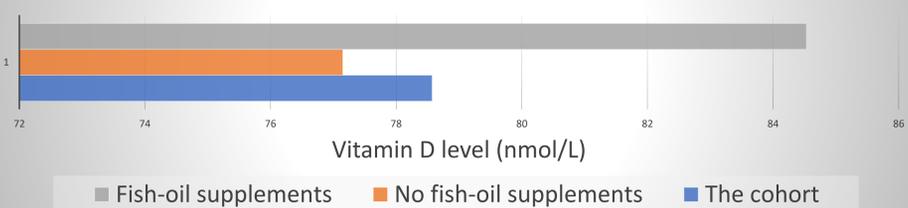
Vitamin D prevalence



Seasonal vitamin D level



Average vitamin D status compared to supplemental intake of fish-oil tablets



- Only 57.6% had an adequate level of vitamin D (n=129)
- 30.4% (n=68) had a subnormal level, 10.3% (n=23) had a potential deficiency and 1.8% (n=4) had a deficiency
- As many as 92.0% (n=206) took some kind of dietary vitamin D supplements
- Increased pre-pregnancy BMI was significant associated with lower levels of vitamin D (p=0.04)
- The mean serum vitamin D levels were highest in June and decreased continuously during autumn and winter
- The average vitamin D level was higher among 18.8% (n=42) of the women who took supplemental fish-oil tablets
- The mean vitamin D level among the consumers of fish-oil tablets was 84.53 nmol/L compared to 77.20 nmol/L among the non-consumers

Conclusion

A total of 42.4% of the pregnant women displayed suboptimal vitamin D levels even though the majority took vitamin D supplements. Vitamin D status was negatively affected by high body weight and time of year, but positively affected by fish-oil consumption. The findings supports a beneficial focus on individual vitamin D supplementation among pregnant women, especially during autumn and winter in the Nordic countries.

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