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Longitudinal Vitamin D Deficiency Among Malaysian Pregnant Women and Its Correlation With Neonatal Serum 25-Hydroxyvitamin D Levels

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Abstract

Objective: This study aimed to investigate the longitudinal relationship between maternal vitamin D concentrations during pregnancy and neonatal vitamin D concentrations at birth. **Materials and Methods:** A prospective cohort of 236 healthy pregnant women from various ethnicity in early pregnancy (≤ 20 weeks of pregnancy) was followed at late pregnancy (28–40 weeks of pregnancy) and birth. Maternal serum 25-hydroxyvitamin D (25(OH)D) was assessed at early pregnancy (baseline) and late pregnancy, while neonatal cord serum 25(OH)D at birth. General estimating equations (GEE) were used to analyze the longitudinal association of maternal serum 25(OH)D levels during pregnancy and neonatal cord serum 25(OH)D levels at birth with adjusting for the time exposure, maternal weight gain, ethnicity, and skin type. **Results:** The results showed that the prevalence of vitamin D deficiency (25(OH)D < 50 nmol/L) was at 89.9, 92.2, and 96.1% in early, late pregnancy and in neonatal cord serum, respectively. The GEE analysis showed a trend that longitudinal vitamin D deficiency during pregnancy leads to lower vitamin D concentrations in neonatal cord blood (RR = 1.17; 95% CI (1.05–1.36); $p = 0.04$). **Conclusion:** Longitudinal vitamin D deficiency during pregnancy leads to vitamin D deficiency in neonates at birth. A further trial is needed to affirm this association. © Copyright © 2021 Mustapa Kamal Basha, Abdul Majid, Razali, Abd Rashed, Muhammad and Yahya.

Author keywords

25(OH)D; cord blood; neonates; pregnancy; vitamin D deficiency

MeSH

Female; Humans; Infant, Newborn; Pregnancy; Pregnant Women; Prospective Studies; Vitamin D; Vitamin D Deficiency

EMTREE drug terms

25-hydroxyvitamin D; vitamin D

EMTREE medical terms

female; human; newborn; pregnancy; pregnant woman; prospective study; vitamin D deficiency

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Rickets; Ergocalciferols; 25-Hydroxyvitamin D

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References (45)

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- 1 Woon, F.C., Chin, Y.S., Ismail, I.H., Batterham, M., Latiff, A.H.A., Gan, W.Y., Appannah, G., (...), Chan, Y.M.
Vitamin D deficiency during pregnancy and its associated factors among third trimester Malaysian pregnant women ([Open Access](#))

(2019) *PLoS ONE*, 14 (6), art. no. e0216439. Cited 12 times.
<https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0216439&type=printable>
doi: 10.1371/journal.pone.0216439

[View at Publisher](#)
- 2 Lee, C.L., Ng, B.K., Wu, L.L., Cheah, F.C., Othman, H., Ismail, N.A.M.
Vitamin D deficiency in pregnancy at term: Risk factors and pregnancy outcomes

(2017) *Hormone Molecular Biology and Clinical Investigation*, 31 (3), art. no. 0005. Cited 13 times.
<http://www.degruyter.com/view/j/hmbci?rskey=UasnVS&result=1&q=Hormone Molecular Biology and Clinical Investigation>
doi: 10.1515/hmbci-2017-0005

[View at Publisher](#)
- 3 Mohamed, H.J.J., Rowan, A., Fong, B., Loy, S.-L.
Maternal serum and breast milk vitamin D levels: Findings from the Universiti Sains Malaysia pregnancy cohort study ([Open Access](#))

(2014) *PLoS ONE*, 9 (7), art. no. e100705. Cited 28 times.
<http://www.plosone.org/article/fetchObject.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0100705&representation=PDF>
doi: 10.1371/journal.pone.0100705

[View at Publisher](#)

-
- 4 Bukhary, N.B.I., Isa, Z.M., Shamsuddin, K., Lin, K.G., Mahdy, Z.A., Hassan, H., Yeop, N.S.H.
Risk factors for antenatal hypovitaminosis D in an urban district in Malaysia ([Open Access](#))

(2016) *BMC Pregnancy and Childbirth*, 16 (1), art. no. 156. Cited 20 times.
<http://www.biomedcentral.com/bmcpregnancychildbirth/>
doi: 10.1186/s12884-016-0939-3

View at Publisher
-
- 5 Skowrońska-Józwiak, E., Lebedzińska, K., Smyczyńska, J., Lewandowski, K.C., Głowacka, E., Lewiński, A.
Effects of maternal vitamin D status on pregnancy outcomes, health of pregnant women and their offspring
(2014) *Age*, 31, p. 4. Cited 2 times.
25275261, :.2
-
- 6 Morales, E., Romieu, I., Guerra, S., Ballester, F., Rebagliato, M., Vioque, J., Tardón, A., (...), Sunyer, J.
Maternal vitamin D status in pregnancy and risk of lower respiratory tract infections, wheezing, and asthma in offspring

(2012) *Epidemiology*, 23 (1), pp. 64-71. Cited 128 times.
doi: 10.1097/EDE.0b013e31823a44d3

View at Publisher
-
- 7 Halicioglu, O., Aksit, S., Koc, F., Akman, S.A., Albudak, E., Yaprak, I., Coker, I., (...), Gulec, E.S.
Vitamin D deficiency in pregnant women and their neonates in spring time in western Turkey

(2012) *Paediatric and Perinatal Epidemiology*, 26 (1), pp. 53-60. Cited 88 times.
[http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/\(ISSN\)1365-3016](http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/(ISSN)1365-3016)
doi: 10.1111/j.1365-3016.2011.01238.x

View at Publisher
-
- 8 Toher, C., Lindsay, K., Mckenna, M., Kilbane, M., Curran, S., Harrington, L., Uduma, O., (...), Mcauliffe, F.M.
Relationship between vitamin D knowledge and 25-hydroxyvitamin D levels amongst pregnant women ([Open Access](#))

(2014) *Journal of Human Nutrition and Dietetics*, 27 (3), pp. 261-269. Cited 26 times.
www.blacksci.co.uk/~cgilib/jnlpage.bin?journal=jhnd&file=jhnd&Page=aims
doi: 10.1111/jhn.12150

View at Publisher
-
- 9 Mustapa Kamal Basha, M.A., Majid, H.A., Razali, N., Yahya, A.
Risk of eczema, wheezing and respiratory tract infections in the first year of life: A systematic review of vitamin D concentrations during pregnancy and at birth ([Open Access](#))

(2020) *PLoS one*, 15 (6), p. e0233890. Cited 3 times.
doi: 10.1371/journal.pone.0233890

View at Publisher
-
- 10 Al-Sadat, N., Majid, H.A., Sim, P.Y., Su, T.T., Dahlui, M., Bakar, M.F.A., Dzaki, N., (...), Jalaludin, M.Y.
Vitamin D deficiency in Malaysian adolescents aged 13 years: Findings from the Malaysian Health and Adolescents Longitudinal Research Team study (MyHeARTs) ([Open Access](#))

(2016) *BMJ Open*, 6 (8), art. no. 010689. Cited 22 times.
<http://bmjopen.bmj.com.ezlib.iium.edu.my/content/early/by/section>
doi: 10.1136/bmjopen-2015-010689

View at Publisher
-

- 11 Suriawati, A.A., Majid, H.A., Al-Sadat, N., Mohamed, M.N.A., Jalaludin, M.Y.
Vitamin D and calcium intakes, physical activity, and calcaneus BMC among school-going 13-year old Malaysian adolescents ([Open Access](#))
- (2016) *Nutrients*, 8 (10), art. no. 666. Cited 10 times.
<http://www.mdpi.com/2072-6643/8/10/666/pdf>
doi: 10.3390/nu8100666
- [View at Publisher](#)
-
- 12 Moy, F.M.
Vitamin D status and its associated factors of free living Malay adults in a tropical country, Malaysia
- (2011) *Journal of Photochemistry and Photobiology B: Biology*, 104 (3), pp. 444-448. Cited 36 times.
doi: 10.1016/j.jphotobiol.2011.05.002
- [View at Publisher](#)
-
- 13 Nurbazlin, M., Chee, W.S.S., Rokiah, P., Tan, A.T.B., Chew, Y.Y., Nusaibah, A.R.S., Chan, S.P.
Effects of sun exposure on 25(OH) vitamin D concentration in urban and rural women in Malaysia
- (2013) *Asia Pacific Journal of Clinical Nutrition*, 22 (3), pp. 391-399. Cited 45 times.
<http://apjcn.nhri.org.tw/server/APJCN/22/3/391.pdf>
doi: 10.6133/apjcn.2013.22.3.15
- [View at Publisher](#)
-
- 14 Wagner, C.L., Hollis, B.W.
The implications of vitamin D status during pregnancy on mother and her developing child ([Open Access](#))
- (2018) *Frontiers in Endocrinology*, 9 (AUG), art. no. 500. Cited 47 times.
<https://www.frontiersin.org/articles/10.3389/fendo.2018.00500/full>
doi: 10.3389/fendo.2018.00500
- [View at Publisher](#)
-
- 15 Christensen, N., Søndergaard, J., Fisker, N., Christesen, H.T.
Infant Respiratory Tract Infections or Wheeze and Maternal Vitamin D in Pregnancy: A Systematic Review
- (2017) *Pediatric Infectious Disease Journal*, 36 (4), pp. 384-391. Cited 20 times.
<http://journals.lww.com/pidj>
doi: 10.1097/INF.0000000000001452
- [View at Publisher](#)
-
- 16 Pérez-López, F.R., Pasupuleti, V., Mezones-Holguin, E., Benites-Zapata, V.A., Thota, P., Deshpande, A., Hernandez, A.V.
Effect of vitamin D supplementation during pregnancy on maternal and neonatal outcomes: A systematic review and meta-analysis of randomized controlled trials ([Open Access](#))
- (2015) *Fertility and Sterility*, 103 (5), pp. 1278-1288.e4. Cited 161 times.
www.elsevier.com/locate/fertnstert
doi: 10.1016/j.fertnstert.2015.02.019
- [View at Publisher](#)
-
- 17 Dovnik, A., Mujezinović, F., Treiber, M., Pečovnik Balon, B., Gorenjak, M., Maver, U., Takač, I.
Determinants of maternal vitamin D concentrations in Slovenia: A prospective observational study
- (2017) *Wiener Klinische Wochenschrift*, 129 (1-2), pp. 21-28. Cited 7 times.
<http://www.springer.com.ezlib.iium.edu.my/springerwiennewyork/medicine/journal/508>
doi: 10.1007/s00508-016-1142-2
- [View at Publisher](#)

- 18 Kochar, I.S., Vij, V., Sethi, A.
Prevalence of Vitamin D deficiency in cord blood
(2019) *J Clin Neonatol*, 8, p. 10. Cited 4 times.
30027298
-
- 19 Song, S.J., Si, S., Liu, J., Chen, X., Zhou, L., Jia, G., Liu, G., (...), Zhang, J.
Vitamin D status in Chinese pregnant women and their newborns in Beijing and their relationships to birth size ([Open Access](#))

(2013) *Public Health Nutrition*, 16 (4), pp. 687-692. Cited 56 times.
doi: 10.1017/S1368980012003084

[View at Publisher](#)
-
- 20 Agarwal, N., Arya, S.C.
Vitamin D₃ levels in pregnant women and newborns at a private tertiary care hospital in Delhi, India

(2011) *International Journal of Gynecology and Obstetrics*, 113 (3), pp. 240-241. Cited 11 times.
www.elsevier.com/locate/ijgo
doi: 10.1016/j.ijgo.2011.01.005

[View at Publisher](#)
-
- 21 Weisse, K., Winkler, S., Hirche, F., Herberth, G., Hinz, D., Bauer, M., Röder, S., (...), Lehmann, I.
Maternal and newborn vitamin D status and its impact on food allergy development in the German LINA cohort study

(2013) *Allergy: European Journal of Allergy and Clinical Immunology*, 68 (2), pp. 220-228. Cited 155 times.
doi: 10.1111/all.12081

[View at Publisher](#)
-
- 22 Roth, H.J., Schmidt-Gayk, H., Weber, H., Niederau, C.
Accuracy and clinical implications of seven 25-hydroxyvitamin D methods compared with liquid chromatography-tandem mass spectrometry as a reference

(2008) *Annals of Clinical Biochemistry*, 45 (2), pp. 153-159. Cited 247 times.
<http://acb.rsmjournals.com/cgi/reprint/45/2/153>
doi: 10.1258/acb.2007.007091

[View at Publisher](#)
-
- 23 Holick, M.F., Binkley, N.C., Bischoff-Ferrari, H.A., Gordon, C.M., Hanley, D.A., Heaney, R.P., Murad, M.H., (...), Weaver, C.M.
Evaluation, treatment, and prevention of vitamin D deficiency: An endocrine society clinical practice guideline ([Open Access](#))

(2011) *Journal of Clinical Endocrinology and Metabolism*, 96 (7), pp. 1911-1930. Cited 5658 times.
<http://jcem.endojournals.org/content/96/7/1911.full.pdf.html>
doi: 10.1210/jc.2011-0385

[View at Publisher](#)
-
- 24 Pludowski, P., Holick, M.F., Pilz, S., Wagner, C.L., Hollis, B.W., Grant, W.B., Shoenfeld, Y., (...), Soni, M.
Vitamin D effects on musculoskeletal health, immunity, autoimmunity, cardiovascular disease, cancer, fertility, pregnancy, dementia and mortality-A review of recent evidence

(2013) *Autoimmunity Reviews*, 12 (10), pp. 976-989. Cited 516 times.
doi: 10.1016/j.autrev.2013.02.004

[View at Publisher](#)
-
- 25 (2010) *Weight Gain During Pregnancy: Reexamining the Guidelines*. Cited 360 times.
Washington, DC, National Academies Press

- 26 Roberts, W.E.
Skin Type Classification Systems Old and New
(2009) *Dermatologic Clinics*, 27 (4), pp. 529-533. Cited 102 times.
doi: 10.1016/j.det.2009.08.006
View at Publisher
-
- 27 Isa, Z.M., Shamsuddin, K., Bukhari, N.B.I., Lin, K.G., Mahdy, Z.A., Hassan, H., Yeop, N.S.H., (...), Ghazi, H.F.
The reliability of Fitzpatrick Skin Type Chart Comparing to Mexameter (Mx 18) in measuring skin color among first trimester pregnant mothers in Petaling District, Malaysia
(2016) *Malaysian Journal of Public Health Medicine*, 16 (3), pp. 59-65. Cited 5 times.
[http://www.mjphm.org.my/mjphm/journals/2016%20-%20Volume%2016%20\(3\)/THE%20RELIABILITY%20OF%20FITZPATRICK%20SKIN%20TYPE%20CHART%20COMPARING%20TO%20MEXAMETER%20\(MX%2018\)%20IN%20MEASURING%20SKIN%20COLOR%20AMONG%20FIRST%20TRIMESTER%20PREGNANT%20MOTHERS.pdf](http://www.mjphm.org.my/mjphm/journals/2016%20-%20Volume%2016%20(3)/THE%20RELIABILITY%20OF%20FITZPATRICK%20SKIN%20TYPE%20CHART%20COMPARING%20TO%20MEXAMETER%20(MX%2018)%20IN%20MEASURING%20SKIN%20COLOR%20AMONG%20FIRST%20TRIMESTER%20PREGNANT%20MOTHERS.pdf)
-
- 28 Zaleha, M.I., Khadijah, S., Noriklil Bukhary, I.B., Khor, G.L., Zaleha, A.M., Haslinda, H., Noor Sharifatul Hana, Y., (...), Hasanain Faisal, G.
Development and validation of a food frequency questionnaire for vitamin D intake among urban pregnant women in Malaysia
(2015) *Malaysian Journal of Nutrition*, 21 (2), pp. 179-190. Cited 11 times.
http://www.nutriweb.org.my/publications/mjn0021_2/5-Zaleha%20179-190.pdf
-
- 29 Marwaha, R.K., Tandon, N., Chopra, S., Agarwal, N., Garg, M.K., Sharma, B., Kanwar, R.S., (...), Puri, S.
Vitamin D status in pregnant Indian women across trimesters and different seasons and its correlation with neonatal serum 25-hydroxyvitamin D levels (Open Access)
(2011) *British Journal of Nutrition*, 106 (9), pp. 1383-1389. Cited 76 times.
doi: 10.1017/S000711451100170X
View at Publisher
-
- 30 Skowrońska-Jóźwiak, E., Lebedzińska, K., Smyczyńska, J., Lewandowski, K.C., Głowack, E., Lewiński, A.
Effects of maternal vitamin D status on pregnancy outcomes, health of pregnant women and their offspring
(2014) *Neuroendocrinology Letters*, 35 (5), pp. 367-372. Cited 11 times.
www.nel.edu
-
- 31 Ariyawatkul, K., Lersbuasin, P.
Prevalence of vitamin D deficiency in cord blood of newborns and the association with maternal vitamin D status
(2018) *European Journal of Pediatrics*, 177 (10), pp. 1541-1545. Cited 14 times.
link.springer.de/link/service/journals/00431/index.htm
doi: 10.1007/s00431-018-3210-2
View at Publisher
-
- 32 Navaneethan, P., Mani, T., Shrestha, P., Regi, A., Thomas, N., Simon, A.
Vitamin D status of pregnant women and their infants in South India: VIPIS study
(2019) *Int J Reprod Contracep Obstet Gynecol*, 8, p. 7.
-
- 33 Ariffin, M.A.S.M., Fazil, F.N., Yassin, N.M., Junaida, N.S., Gan, P.V., Rahman, R.A., Chin, K.-Y., (...), Aziz, N.H.A.
Prevalence of vitamin d deficiency and its associated risk factors during early pregnancy in a tropical country: A pilot study (Open Access)
(2018) *Journal of Clinical and Diagnostic Research*, 12 (9), pp. QC18-QC22. Cited 2 times.
[http://www.jcdr.net/articles/PDF/12104/36585_CE\[Ra1\]_F\(SHU\)_PFI\(AB_SHU\)_PFA\(SHU\)_PB\(AB_SL_AP\)_PN\(AP\).pdf](http://www.jcdr.net/articles/PDF/12104/36585_CE[Ra1]_F(SHU)_PFI(AB_SHU)_PFA(SHU)_PB(AB_SL_AP)_PN(AP).pdf)
doi: 10.7860/JCDR/2018/36585.12104
View at Publisher

- 34 Aziz, N.H.A., Yazid, N.A., Rahman, R.A., Rashid, N.A., Wong, S.K., Mohamad, N.V., Lim, P.S., (...), Chin, K.-Y.
Is first trimester maternal 25-hydroxyvitamin d level related to adverse maternal and neonatal pregnancy outcomes? A prospective cohort study among Malaysian women ([Open Access](#))

(2020) *International Journal of Environmental Research and Public Health*, 17 (9), art. no. 3291. Cited 2 times.
<https://www.mdpi.com/1660-4601/17/9/3291/pdf>
doi: 10.3390/ijerph17093291

View at Publisher
-
- 35 Choi, R., Kim, S., Yoo, H., Cho, Y.Y., Kim, S.W., Chung, J.H., Oh, S.-Y., (...), Lee, S.-Y.
High prevalence of Vitamin D deficiency in pregnant Korean women: The first trimester and the winter season as risk factors for Vitamin D deficiency ([Open Access](#))

(2015) *Nutrients*, 7 (5), pp. 3427-3448. Cited 52 times.
<http://www.mdpi.com/2072-6643/7/5/3427/pdf>
doi: 10.3390/nu7053427

View at Publisher
-
- 36 Orvik, A.B., Andersen, M.R., Bratholm, P.S., Hedengran, K.K., Ritz, C., Stender, S., Szecsi, P.B.
Variation in plasma 25-hydroxyvitamin D2 and D3 in normal pregnancy with gestational age, sampling season, and complications: A longitudinal cohort study ([Open Access](#))

(2020) *PLoS ONE*, 15 (4), art. no. e0231657. Cited 4 times.
<https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0231657&type=printable>
doi: 10.1371/journal.pone.0231657

View at Publisher
-
- 37 Tsuprykov, O., Buse, C., Skoblo, R., Haq, A., Hocher, B.
Reference intervals for measured and calculated free 25-hydroxyvitamin D in normal pregnancy

(2018) *Journal of Steroid Biochemistry and Molecular Biology*, 181, pp. 80-87. Cited 23 times.
www.elsevier.com/locate/jsbmb
doi: 10.1016/j.jsbmb.2018.03.005

View at Publisher
-
- 38 Holmes, V.A., Barnes, M.S., Alexander, H.D., McFaul, P., Wallace, J.M.W.
Vitamin D deficiency and insufficiency in pregnant women: A longitudinal study ([Open Access](#))

(2009) *British Journal of Nutrition*, 102 (6), pp. 876-881. Cited 181 times.
doi: 10.1017/S0007114509297236

View at Publisher
-
- 39 Fowden, A.L., Coan, P.M., Angiolini, E., Burton, G.J., Constancia, M.
Imprinted genes and the epigenetic regulation of placental phenotype

(2011) *Progress in Biophysics and Molecular Biology*, 106 (1), pp. 281-288. Cited 88 times.
doi: 10.1016/j.pbiomolbio.2010.11.005

View at Publisher
-
- 40 Hollis, B.W., Wagner, C.L.
New insights into the Vitamin D requirements during pregnancy ([Open Access](#))

(2017) *Bone Research*, 5, art. no. 17030. Cited 52 times.
<http://www.nature.com/boneres/>
doi: 10.1038/boneres.2017.30

View at Publisher

□ 41 Carrelli, A., Bucovsky, M., Horst, R., Cremers, S., Zhang, C., Bessler, M., Schrope, B., (...), Stein, E.M.
Vitamin D Storage in Adipose Tissue of Obese and Normal Weight Women (Open Access)
(2017) *Journal of Bone and Mineral Research*, 32 (2), pp. 237-242. Cited 71 times.
[http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1002/\(ISSN\)1523-4681](http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1002/(ISSN)1523-4681)
doi: 10.1002/jbmr.2979
View at Publisher

□ 42 Drincic, A.T., Armas, L.A.G., Van Diest, E.E., Heaney, R.P.
Volumetric dilution, rather than sequestration best explains the low vitamin D status of obesity
(2012) *Obesity*, 20 (7), pp. 1444-1448. Cited 343 times.
doi: 10.1038/oby.2011.404
View at Publisher

□ 43 Roth, D.E., Abrams, S.A., Aloia, J., Bergeron, G., Bourassa, M.W., Brown, K.H., Calvo, M.S., (...), Whiting, S.J.
Global prevalence and disease burden of vitamin D deficiency: a roadmap for action in low- and middle-income countries (Open Access)
(2018) *Annals of the New York Academy of Sciences*. Cited 111 times.
[http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/\(ISSN\)1749-6632](http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/(ISSN)1749-6632)
doi: 10.1111/nyas.13968
View at Publisher

□ 44 Cherif, R., Hasanov, F.
(2015) *The Leap of the Tiger: How Malaysia Can Escape the Middle-Income Trap*. Cited 23 times.
Washington, DC, International Monetary Fund

□ 45 Hollis, B.W., Wagner, C.L., Howard, C.R., Ebeling, M., Shary, J.R., Smith, P.G., Taylor, S.N., (...), Hulsey, T.C.
Maternal versus infant Vitamin D supplementation during lactation: A randomized controlled trial (Open Access)
(2015) *Pediatrics*, 136 (4), pp. 625-634. Cited 108 times.
<http://pediatrics.aappublications.org/content/136/4/625.full.pdf+html>
doi: 10.1542/peds.2015-1669
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