Acta Poloniae Pharmaceutica – Drug Research, Vol. 72 No. 1 pp. 213–215, 2015 ISSN 0001-6837
Polish Pharmaceutical Society

SHORT COMMUNICATION

VARIATION IN VITAMIN D PLASMA LEVELS ACCORDING TO STUDY LOAD OF BIOMEDICAL STUDENTS

OLIVERA Z. MILOVANOVIC[1], JASMINA R. MILOVANOVIC[2]*, ALEKSANDAR DJUKIC[3], MILOVAN MATOVIC[4], ALEKSANDRA TOMIC LUCIC[5], NENAD GLUMBIC[6], ANA M. RADOVANOVIC[1] and SLOBODAN M. JANKOVIC[2]

[1]Department of Pharmacy, [2]Department of Pharmacology and Toxicology, [3]Department of Internal Medicine – Endocrinology, [4]Department of Nuclear Medicine, [5]Department of Internal Medicine – Rheumatology, Faculty of Medical Sciences, University of Kragujevac, Kragujevac, Serbia
[6]Department of Special Education and Rehabilitation, Faculty for Special Education and Rehabilitation, University of Belgrade

Keywords: 25-hydroxyvitamin D, vitamin D deficiency, biomedical study, focus group

Students' life can be perceived by the different prisms. On one hand, that is the happiest time of life while on the other side, that is a period that changes lifestyle habits. Numerous studying commitments over a school year can decrease certain extracurricular activities such as spending time outdoors, playing a sport or just walking and consequently lead to reduced exposure to sunlight, which is the major risk factor for vitamin D deficiency. Vitamin D is substantial for achieving and up keeping calcium homeostasis and consequently accomplishing skeleton health. Besides the aforementioned, there is a great number of studies that showed a whole variety of vitamin D effects on human body such as prevention of cancer, cardiovascular, autoimmune, infectious and respiratory diseases, and preservation of mental health (cognitive impairment and depression) (1–3).

Our aim was to see how study load and some other factors correlate with vitamin D plasma levels of healthy students from the Faculty of Medical Sciences in Kragujevac. The study was approved by the Ethics Committee of the Faculty of Medical Sciences, University of Kragujevac, Serbia and the students signed informed consent for participation in the study. The study took place from April 2012 to August 2012. The students were from three different study courses (medicine, pharmacy and dentistry) and from various study years (from 1 to 5).

Average vitamin D level (25-hydroxyvitamin D) in the study population of 86 students was 13.263 ± 4.86 ng/mL that was significantly below cut off point for sufficient vitamin D level ($p < 0.001$) (2). Vitamin D deficiency was observed in 88.37% participants. Sex, study course, average study score, average vitamin D food intake (calculated for period of 30 days before blood samples were taken), body mass index, biochemical parameters (phosphate level, urea, creatine, total protein) and endocrine parameters (FT4, TSH and PTH level) did not correlate with vitamin D plasma levels ($p > 0.05$). There was weak but significant correlation betwen level of vitamin D (25-hydroxyvitamin D) and calcium level ($r = 0.228$; $p \geq 0.05$).

However, the year of study influenced vitamin D levels ($p \geq 0.05$): the students of the third year of study had the lowest average level while students of the fifth year had the highest average level of vitamine D, 11.825 ± 4.372 ng/mL and 15.397 ± 4.103 ng/mL, respectively (Fig. 1). We thought that reason for such results may be decreased exposure to sunlight of students in the third year in comparison with other years ($p \geq 0.05$).

In order to examine the influence of study load on variation of serum vitamin D level by biomedical students authors created a focus group that was composed of 15 graduated students by Faculty of

* Corresponding author: e-mail: Jasminamilo@yahoo.com; phone: +381 34 306800 111; fax: +381 34 306800

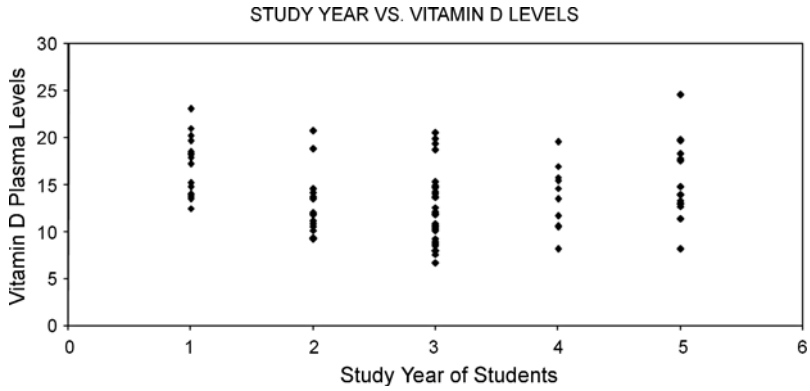

Figure 1. Vitamin D plasma level in relation to study year

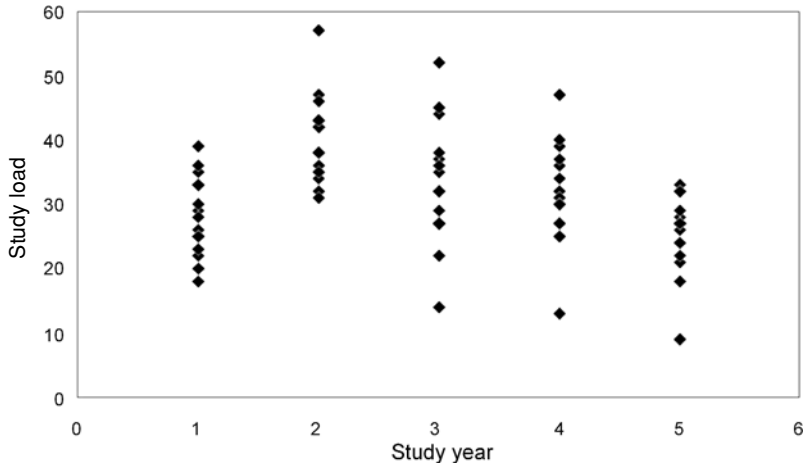

Figure 2. Perception of study load by focus group according to study year

Medical Sciences, in Kragujevac. After discussion about the topic, members of the focus group rated study load of each of the study subjects on a scale from 1 to 5 where mark 1 meant "the lowest load" while mark 5 presented "the highest load". Estimate of the total study load for particular year of study was then calculated as the sum of estimated loads of each subject from that year. The results are shown in Figure 2, where it can be seen that the second year of study bears the highest student workload, then followed by the third, fourth and first study years, while the fifth study year bears the lowest load. We believe that this could explain the lowest vitamin D levels in the third study year. As the second study year had the highest study load, we may assume that decreased sun exposure during the second year of study created insufficient amounts of vitamin D, which then were spent during the winter, leading to low plasma levels in the next year, when the measurements took place (4).

Our results point out that vitamin D deficiency was presented in a majority of biomedical students, which is in accordance with epidemic nature of vitamin D deficiency all over the world (5). The study load has an effect on variation of vitamin D levels and it would be useful to supplement vitamin D and prevent its deficiency during the study years with the highest load in order to prevent myriad of adverse consequences of vitamin D deficiency on physical and psychical health (6, 7). Of course, our results remain to be confirmed by larger studies in the future.

Acknowledgments

This study was partially financially supported by Grant No. 175007 given by Serbain Ministry of Education, and by a Grant given by Ministry of Science, Montenegro.

Conflict of interest

All authors have no conflicts of interest.

REFERENCES

1. Wacker M., Holick M.F.: Nutrients 5, 111 (2013).
2. Gröber U., Spitz J., Reichrath J., Kisters K., Holick M.F.: Dermatoendocrinology 5, 331 (2013).
3. Hossein-nezhad A., Holick M.F.: Mayo Clin. Proc. 88, 720 (2013).
4. Holick M.F.: Am. J. Clin. Nutr. 80 (6 Suppl.), 1678S (2004).
5. Bosomworth N.J.: Can. Fam. Physician 57, 16 (2011).
6. van der Schaft J., Koek H.L., Dijkstra E., Verhaar H.J., van der Schouw Y.T., Emmelot-Vonk M.H.: Ageing Res. Rev. 12, 1013 (2013).
7. Maddock J., Geoffroy M.C., Power C., Hyppönen E.: Br. J. Nutr. 111, 904 (2014).

Received: 18. 06. 2014