



STRESS-INDUCED CELL LINE CULTURES COMPARISON AFTER VITAMIN D3 ADMINISTRATION THROUGH INFLAMMATORY GENE EXPRESSION

INTRODUCTION

Muhammad Alamsyah Azka

Preterm birth is a multifactorial process. Vitamin D is one of the nutrients needed in pregnancy, namely in maternal and fetal. Vitamin D deficiency during pregnancy is common in developed countries. Their incidence can reach up to 96.0% to 99.4%. Vitamin D was able to reduce cytokines and Contractile-Associated Protein (CAP) due to the induction of inflammation in human myometrial smooth muscle cells and could prevent preterm birth, thus playing a direct role in regulating myometrial contractility

OBJECTIVE

In this studies, objective is to know the effect of vitamin D3 administration on the expression of various contractility regulatory profile genes on human uterine myometrial smooth muscle cell lines PHM1-41 under oxidative stress.

METHODS

Human uterine myometrium smooth muscle, PHM1-41 cell line (ATCC® CRL3046™) was obtained from American Type Culture Collection (ATCC). This study was a analytical study, data analysis was carried out using univariant and bivariant statistical test by ANOVA if the results were homogen, but if the result was non-homogen, Kruskal Wallis test was used. Tukey HSD, Dunnet, or Mann-Whitney post hoc tests were then performed, with $p < 0.05$ considered as significant. This research was conducted at Aretha Medika Utama Biomolecular and Biomedical Research Centre, Bandung, Indonesia. Cells were cultured under 2D and 3D conditions.

RESULTS

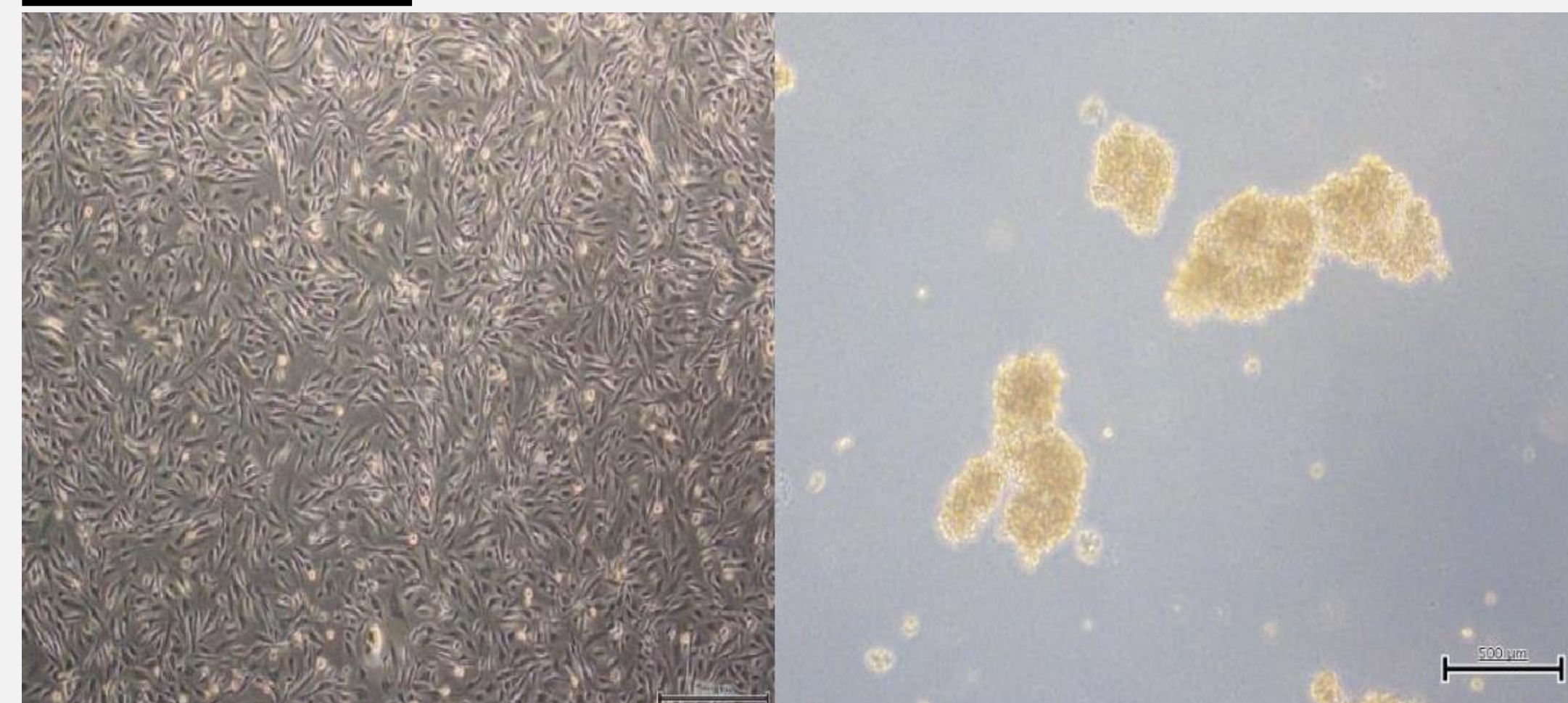


Figure 1. PHM1-41 cells in (a) 2D culture at magnification of 40x and (b) 3D Spheroid at magnification of 100x.

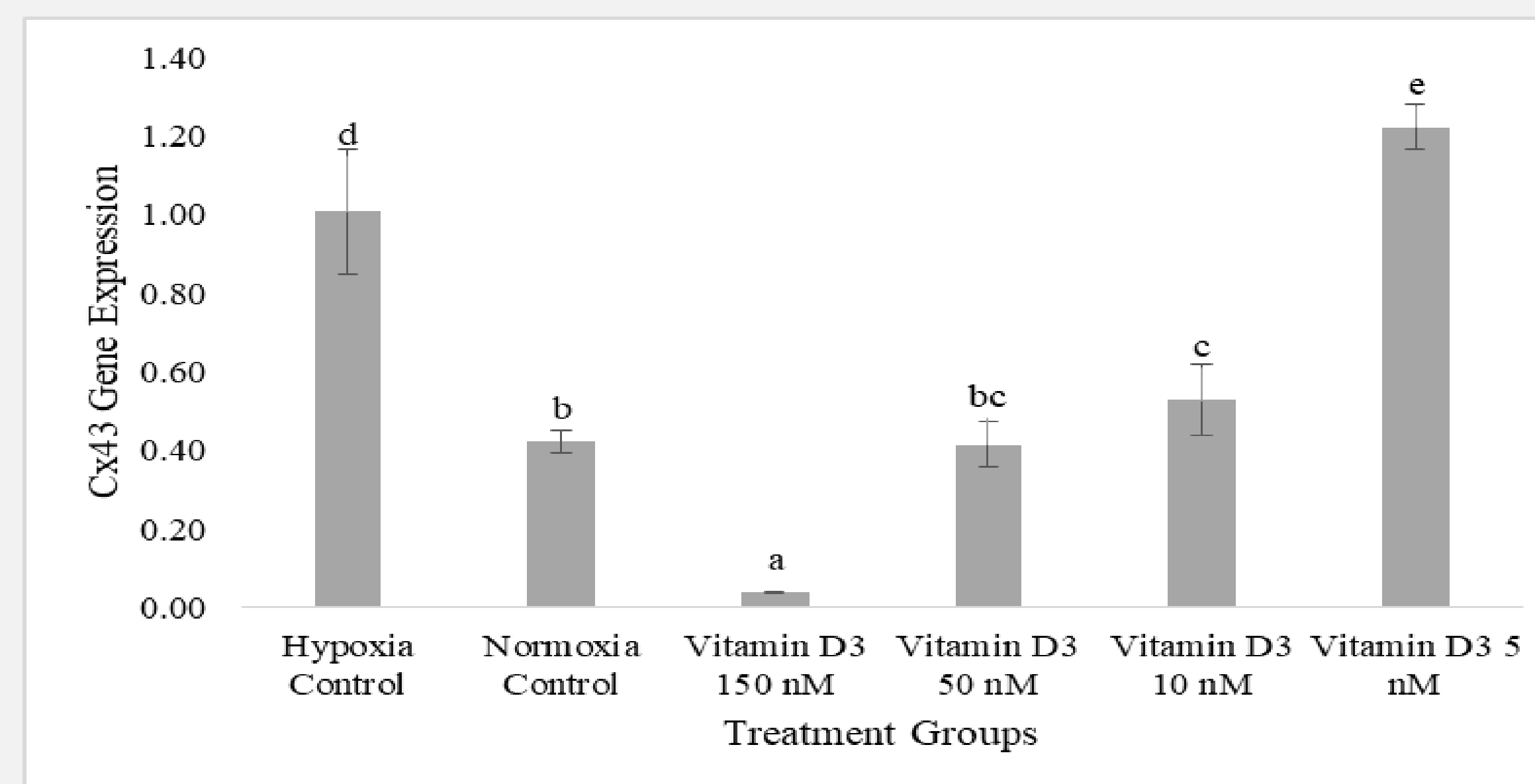


Figure 4. Effect of Vitamin D3 Administration in 3D Spheroid PHM1-41 Cells against Cx43 Gene Expression.

CONCLUSIONS

The addition of vitamin D3 can reduce ROS levels and the expression of genes related to contractility regulation. Under hypoxic oxidative stress, Vitamin D levels of 150 nM are the most optimal for preventing contractility processes in human uterine myometrial smooth muscle cells (PHMI-41) 3D culture. The use of vitamin D3 as an antioxidant can be a potential candidate in the prevention of preterm birth by reducing ROS levels in an in vitro 3D myometrial cell model at the time of preterm birth.

REFERENCES

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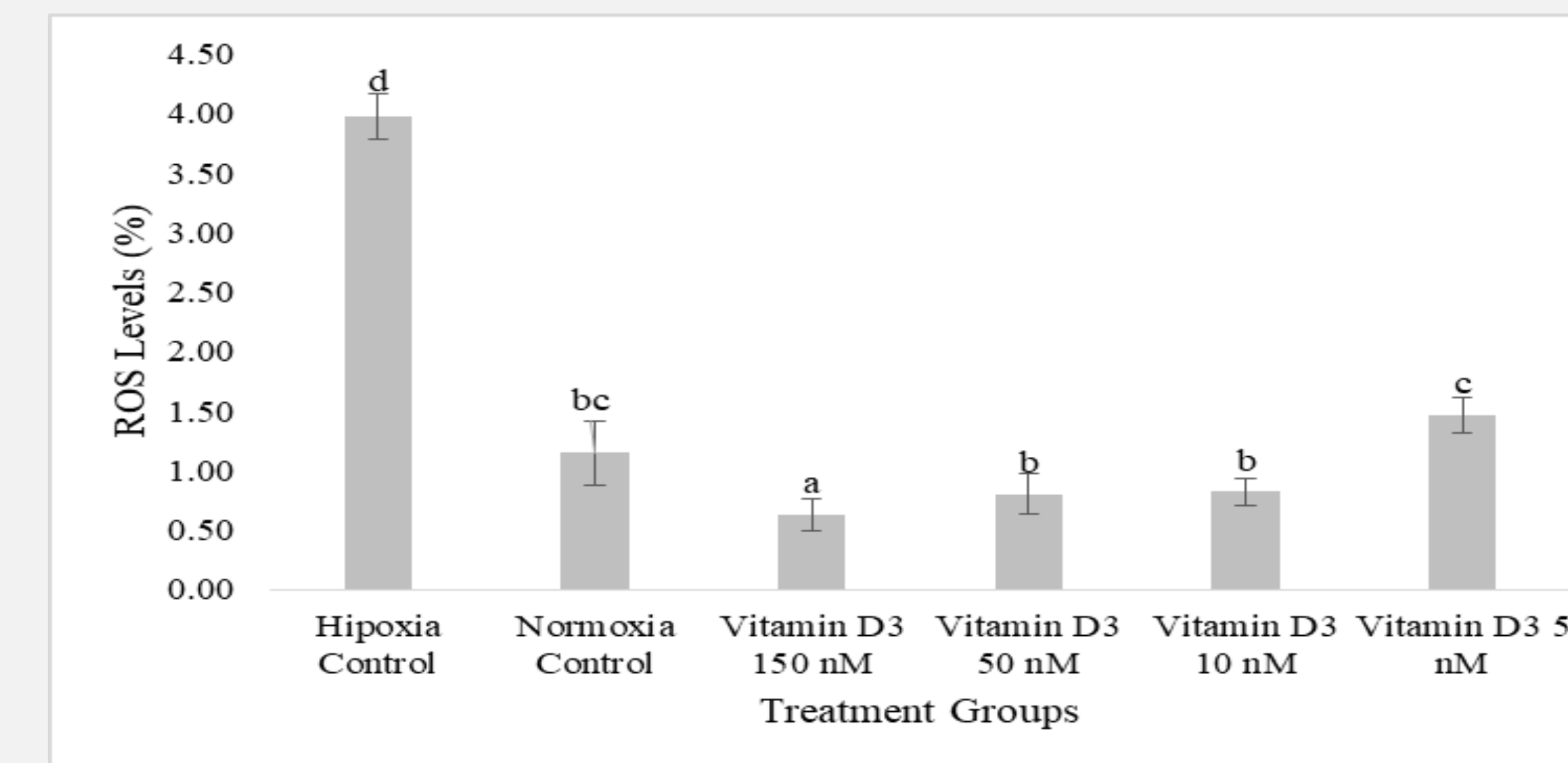


Figure 2. Effect of Vitamin D3 Administration in 3D Spheroid PHM1-41 Cells against ROS Intracellular Levels.

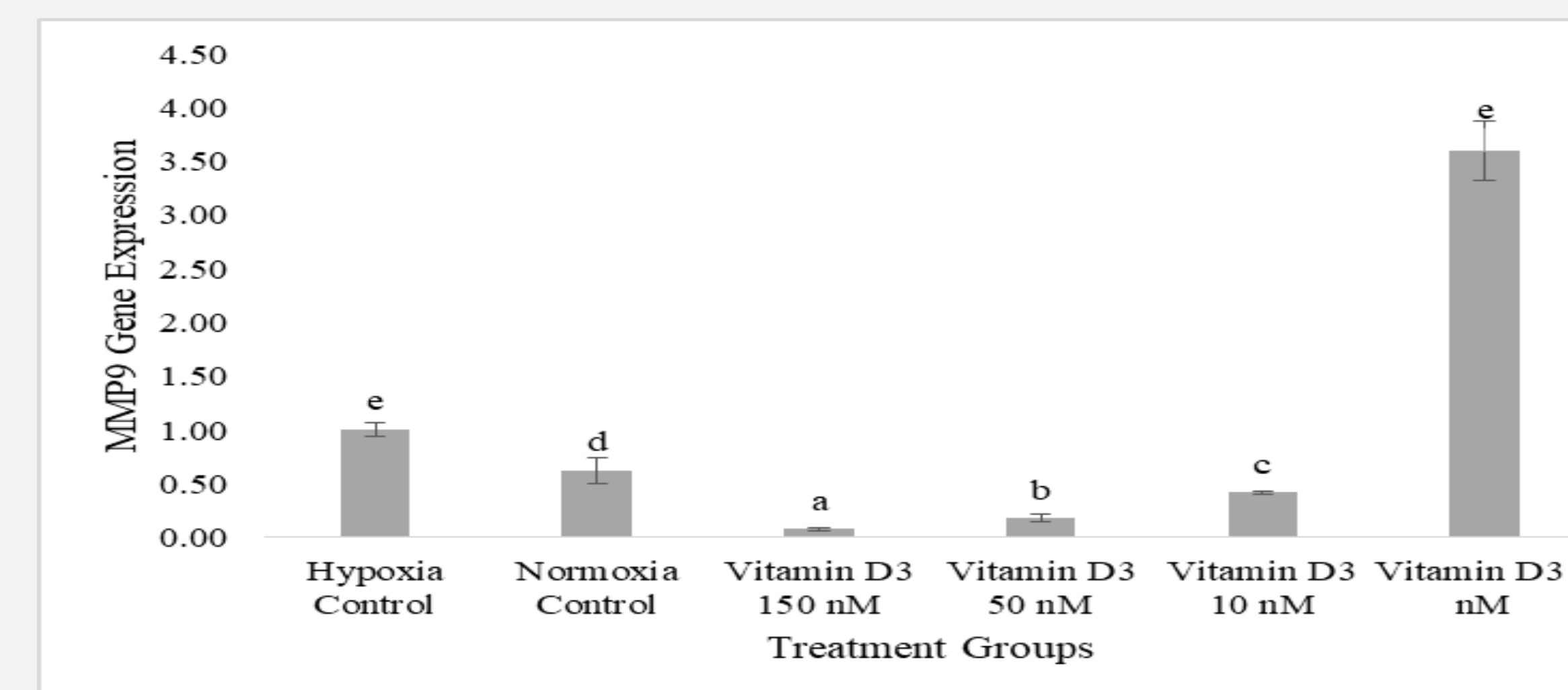


Figure 5. Effect of Vitamin D3 Administration in 3D Spheroid PHM1-41 Cells against MMP9 Gene Expression.

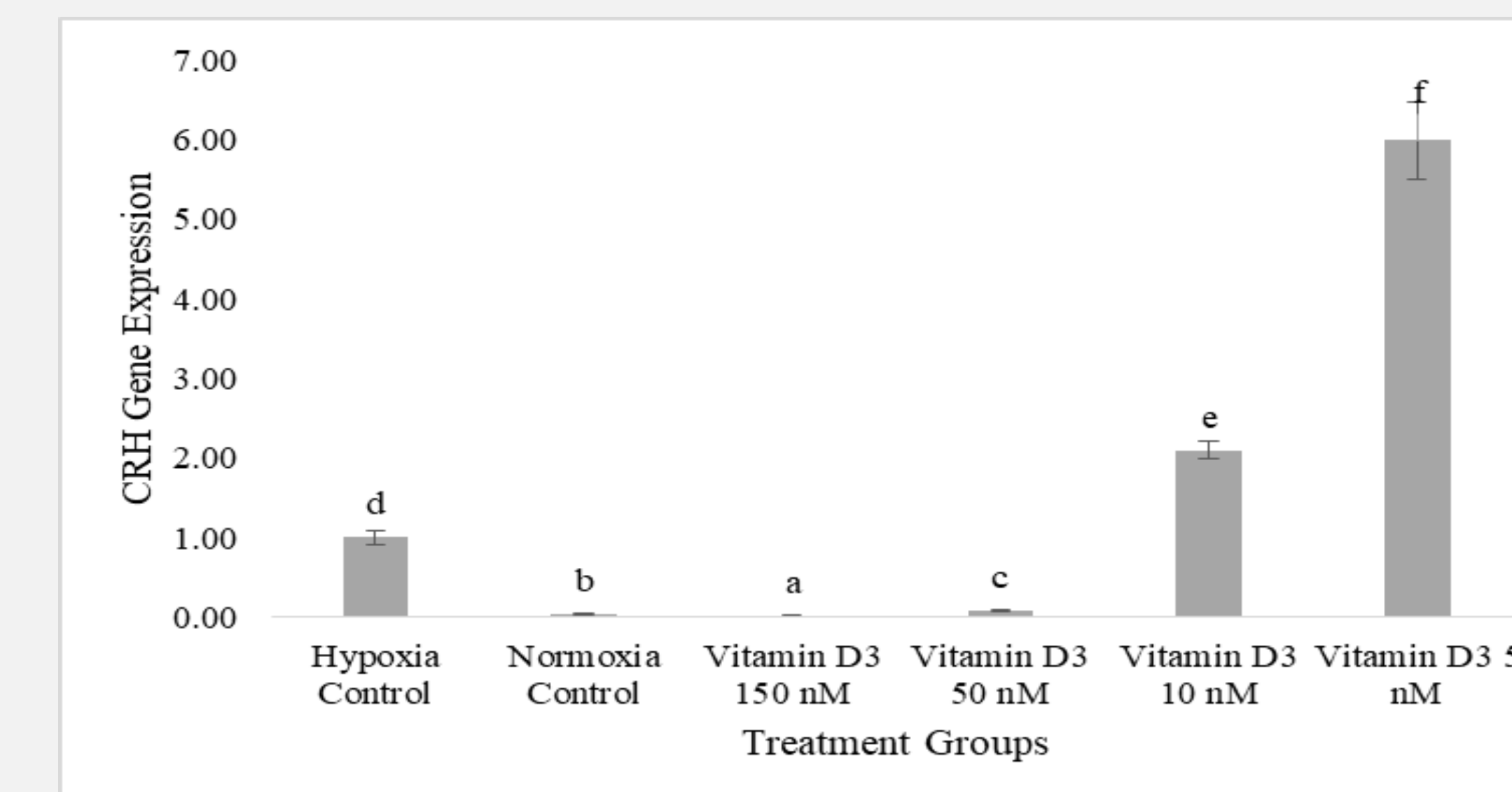


Figure 3. Effect of Vitamin D3 Administration in 3D Spheroid PHM1-41 Cells against CRH Gene Expression

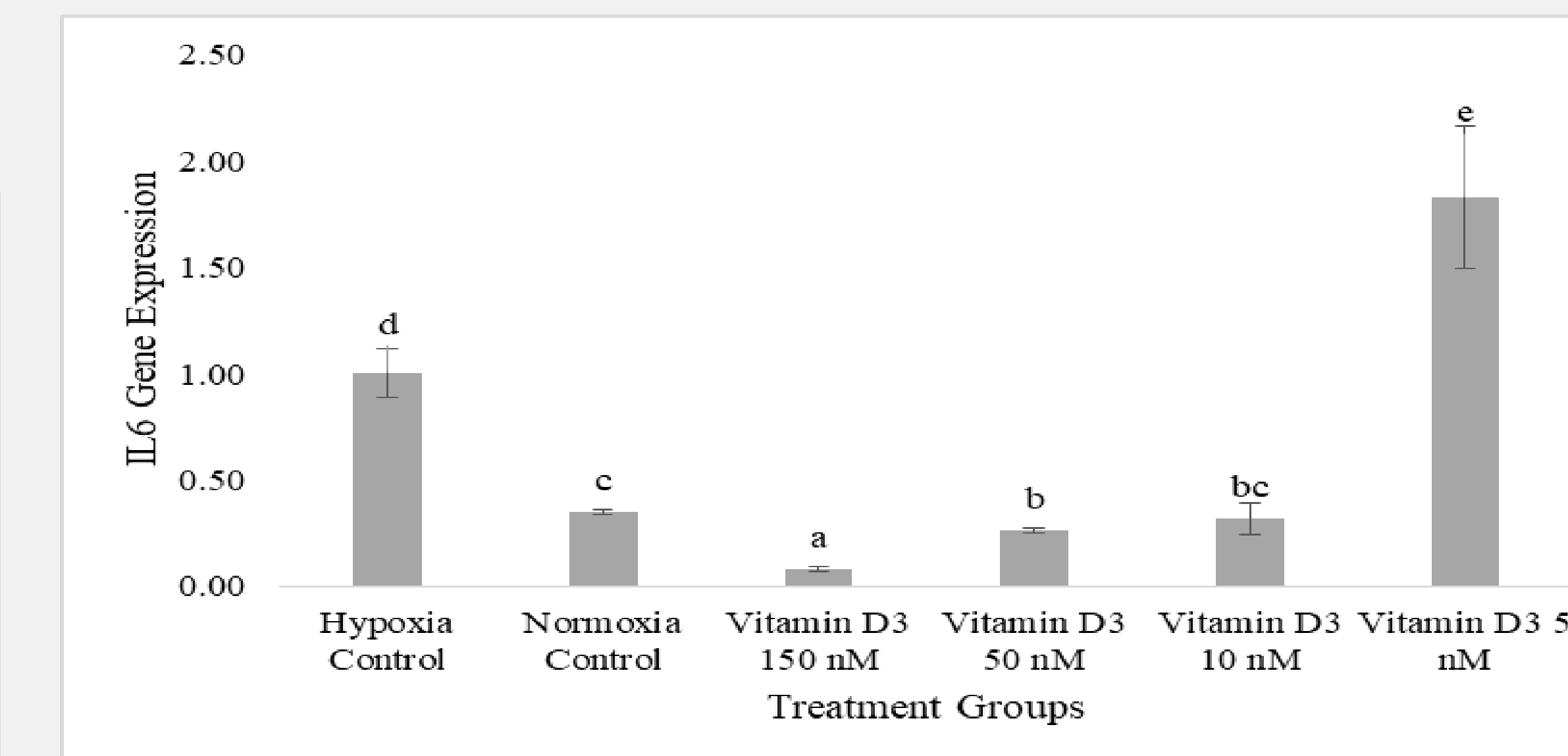


Figure 6. Effect of Vitamin D3 Administration in 3D Spheroid PHM1-41 Cells against IL6 Gene Expression.

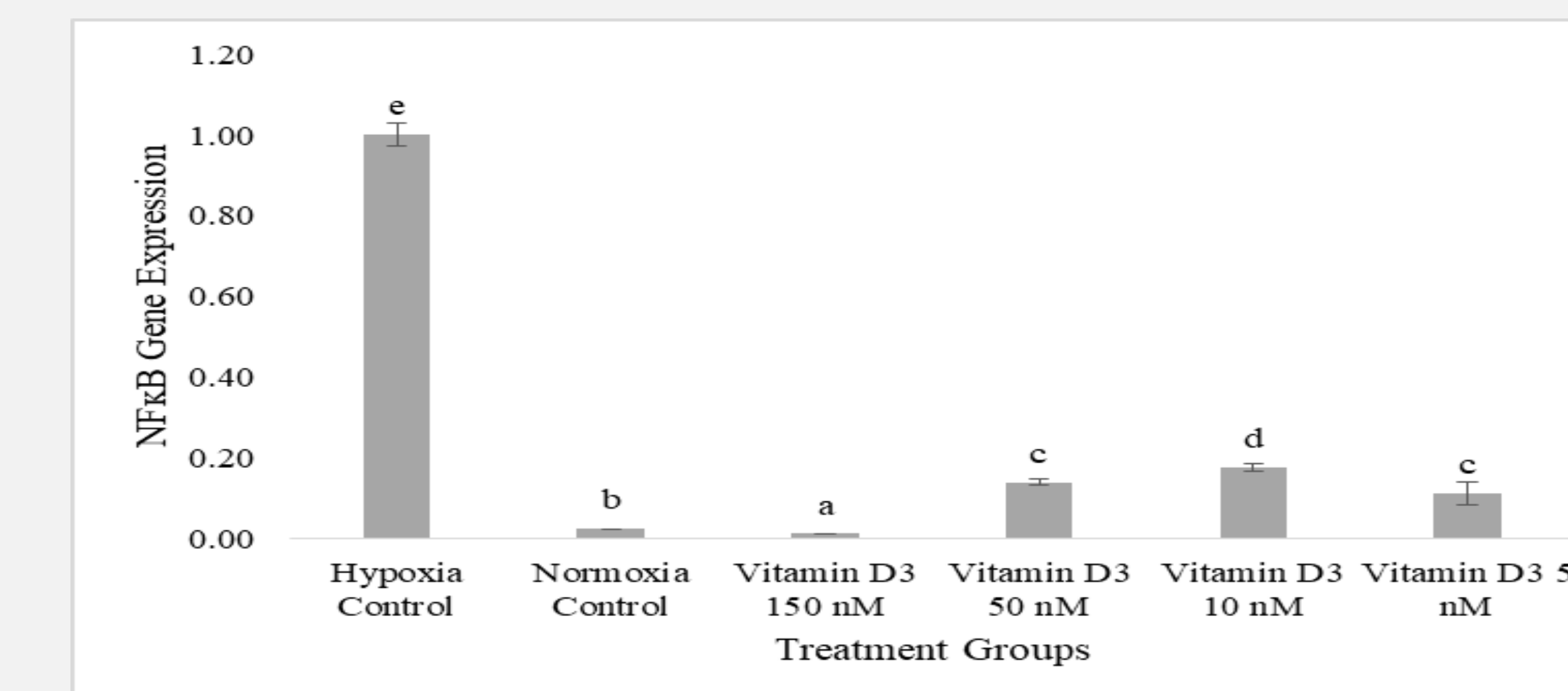


Figure 7. Effect of Vitamin D3 Administration in 3D Spheroid PHM1-41 Cells against NFkB Gene Expression.