

# The Association Between Vitamin D and Acute Rejection in Human Kidney Transplantation: A Systematic Review and Meta-analysis Study

Mohammad Mirzakhani<sup>1,2,3</sup>, Sheyda Mohammadkhani<sup>1,2,†</sup>, Shirin Hekmatirad<sup>1,†</sup>, Soudabeh Aghapour<sup>2,\*</sup>, Negar Gorjizadeh<sup>4,5,\*</sup>, Mehdi Shahbazi<sup>2,3</sup>, Mousa Mohammadnia-Afrouzi<sup>2,3,c</sup>

1. Student Research Committee, School of Medicine, Babol University of Medical Sciences, Babol, Iran
2. Immunoregulation Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
3. Department of Immunology, Faculty of Medicine, Babol University of Medical Sciences, Babol, Iran
4. Department of cell and molecular biology, Faculty Biological Sciences, Kharazmi University, Tehran, Iran
5. Cellular and Molecular biology Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran.

## **Authors' information:**

Mohammad Mirzakhani MSc. : m.mirzakhani@mubabol.ac.ir

<https://orcid.org/0000-0002-8831-3006>

Sheyda Mohammadkhani MSc. : sheydamohammadkhani@gmail.com

Shirin Hekmatirad MSc. : shrad189@yahoo.com

Soudabeh Aghapour MSc. : aghapour8666@gmail.com

Negar Gorjizadeh MSc. : negar.gorjizadeh@yahoo.com

Mehdi Shahbazi Ph.D. : m.shahbazi@mubabol.ac.ir

Mousa Mohammadnia-Afrouzi Ph.D. : m.mohammadnia@mubabol.ac.ir <https://orcid.org/0000-0003-2083-7425>

†: These authors contributed equally to this work.

\*: These authors contributed equally to this work.

## **c: Corresponding author:**

Dr. Mousa Mohammadnia-Afrouzi; Department of Immunology, School of Medicine, Babol University of Medical Sciences, Ganjafrooz Street, Babol, I.R.Iran.

Postal code: 47176-47745, Tel: +98-1132192832, Fax: +98-1132192959, e-mail: m.mohammadnia@mubabol.ac.ir.

## **NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE** **(adapted for cross sectional studies)**

### **Selection:** (Maximum 5 stars)

#### 1) Representativeness of the sample:

- a) Truly representative of the average in the target population. \* (all subjects or random sampling)
- b) Somewhat representative of the average in the target population. \* (nonrandom sampling)
- c) Selected group of users.
- d) No description of the sampling strategy.

#### 2) Sample size:

- a) Justified and satisfactory. \*
- b) Not justified.

#### 3) Non-respondents:

- a) Comparability between respondents and non-respondents characteristics is established, and the response rate is satisfactory. \*
- b) The response rate is unsatisfactory, or the comparability between respondents and non-respondents is unsatisfactory.
- c) No description of the response rate or the characteristics of the responders and the non-responders.

#### 4) Ascertainment of the exposure (risk factor):

- a) Validated measurement tool. \*\*
- b) Non-validated measurement tool, but the tool is available or described.\*
- c) No description of the measurement tool.

### **Comparability:** (Maximum 2 stars)

#### 1) The subjects in different outcome groups are comparable, based on the study design

or analysis. Confounding factors are controlled.

- a) The study controls for the most important factor (select one). \*
- b) The study control for any additional factor. \*

**Outcome:** (Maximum 3 stars)

1) Assessment of the outcome:

- a) Independent blind assessment. \*\*
- b) Record linkage. \*\*
- c) Self report. \*
- d) No description.

2) Statistical test:

- a) The statistical test used to analyze the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (p value). \*
- b) The statistical test is not appropriate, not described or incomplete.

3) **The rate of 25(OH)D level**

a) For 25(OH)D deficient group  $<15$  ng/ml and for 25(OH)D sufficient group  $\geq 30$  ng/ml **(one star)**

b) For 25(OH)D deficient group  $>15$  25(OH)D  $<20$  ng/ml or for 25(OH)D sufficient group  $\geq 20$  25(OH)D  $<30$  ng/ml