PREVALENCE OF HYPOCALCAEMIA, ABO AND RH-D BLOOD GROUPS IN FEMALE STUDENTS AT INSTITUTE OF PARAMEDICAL SCIENCES, KHYBER MEDICAL UNIVERSITY, PESHAWAR

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ABSTRACT

OBJECTIVE: The objective of current study was to determine the prevalence of Hypocalcaemia, ABO and Rh-D blood groups in female students of Institute of Paramedical Sciences, Khyber Medical University, Peshawar.

METHODS: One hundred and three female students meeting inclusion criteria were conveniently included in the study from July 1, 2017 to December 31, 2017. Hypocalcaemia was measured using O-cresolphthalein method by semi-automated instruments. Blood grouping were performed at the site of blood collection by forward blood grouping method.

RESULTS: The prevalence of hypocalcaemia was 82.5% with mean serum calcium level of the studied participants was 7.97±0.45 mg/dl. We detected only mild (37.6%) and moderate (62.4%) hypocalcaemia and none of the participants was severe calcium deficient. The frequencies of ABO blood groups were group A was 21.4% (22/103), group B was 40.7% (42/103), group AB was 10.7%) (11/103) and group O was 27.2% (28/103). In the Rh-D blood group the frequency of positive Rh-D was 96.1% (99/103) while negative was 3.9% (4/103).

CONCLUSION: The prevalence of Hypocalcaemia is very high in female students but severe hypocalcaemia is not detected. Blood group B show dominance over other in the studied population.

KEY WORD: Hypocalcaemia, ABO blood group, Rh-D blood group

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INTRODUCTION

Hypocalcaemia is a term refers to low serum calcium concentration than normal and it signifies serious interference in homeostasis of calcium (1). Calcium and vitamin D are essential nutrients for the human body throughout the life and are closely linked as vitamin-D deficiency can reduce intestinal absorption of calcium (2). Hypocalcaemia is a frequent biochemical disorder that varies in severity from being subclinical illness to severe fatal crises (3). Hypocalcaemia is most frequently an outcome of inadequacy of vitamin-D and parathyroid hormone (4). Calcium insufficiency is the challenge in both develop and developing world (5).

Since 1901, more than 20 different blood group systems have been categorized but clinically the ABO and Rh-D blood group systems are the most significant (6). In 1901, Landsteiner discovered the ABO blood group system (7). While in 1941, Wiener and Landsteiner defined Rh-D blood group system (8).

These two blood groups distribution have been investigated several time in different populations form the past half century over the world. The frequencies reveal enormous variation in distinct geographic regions including different areas of Pakistan (9). The ABO and Rh-D antigens are not only significant in organ transplantation and blood transfusion, but also have importance in anthropology, and can be used in genetic study, training familial relative of human being (10). Consequently it is useful to file the incidence of ABO and Rh-D blood types in the different parts of Pakistan; therefore, the current was conducted to determine the distribution frequency of hypocalcaemia, ABO and Rh-D blood group.

METHODS

The current prospective cross sectional study was conducted in Institute of Paramedical Sciences, Khyber Medical University (IPMS-KMU), Peshawar from July 1, 2017 to the end of December, 2017. One hundred and three female students meeting inclusion criteria were conveniently recruited in the study after verbal consent. A 3ml of blood sample was collected from each participant of the study and blood grouping was performed at the site of collection by forward blood grouping method. Total serum calcium was measured by semi-automated analyser using O-cresolphthalein method according to the instruction of the manufacturer.

RESULTS

A total of 103 females belong to age group of 18 to 24 years were subjected to study. The prevalence of hypocalcaemia was 82.5% with mean serum calcium level of the studied participants was 7.97±0.45 mg/dl, while the range observed was 6.31 to 8.81 mg/d. We detected only mild (37.6%) and moderate (62.4%) hypocalcaemia and none of the participants was severe calcium deficient (Table. 1).

Table.1 Frequency of study participants in different level of hypocalcaemia

Hypocalcaemia	No of Participants	Frequency (%)	Reference range
Mild	32	37.6	8.0 to 8.4 mg/dl
Moderate	53	62.4	4 to 7.96 mg/dl
Severe	0	0	less than 4 mg/dl
Total	85	100%	

The frequencies of ABO blood groups among 103 participants were group A was 21.4% (22/103), group B was 40.7% (42/103), group AB was 10.7%) (11/103) and group O was 27.2% (28/103). In the Rh-D blood group the frequency of positive Rh-D was 96.1% (99/103) while negative was 3.9% (4/103). (Table 2)

Table.2 Frequency of ABO among Rh-D Positive and Negative participants

Blood groups	A +ive	B +ive	B -ive	AB +ive	O +ive	O -ive	Total
Frequencies	22 21.4%	39 37.9%	3 2.9%	11 10.7%	27 26.2%	1 1.0%	103 100%

DISCUSSION

This study was done to evaluate hypocalcaemia, ABO and Rh-D prevalence among female students of IPMS-KMU. The prevalence of hypocalcaemia was 82.5% and the distribution frequency of group A was 21.4%, group B was 40.7%, group AB was 10.7% and group O was 27.2%. While distribution frequency of anti Rh-D positive was 96.1% and anti Rh-D negative was 3.9%.

To the best of our knowledge, there is no data available for calcium level in asymptomatic females in Pakistan. However several studies on vitamin-D show deficiency in Pakistani population. A study conducted on vitamin-D deficiency in Lahore in child bearing women shows 73% frequency (11). This supports our study findings because vitamin-D deficiency limits dietary calcium absorption to about 10 to 15% (12). Another contributing factor for this hypocalcaemia may be the presence of significant amount of phytates and oxalates in Pakistani food. These compounds form insoluble complex with calcium thereby reducing its absorption (13).

The findings in the current study regarding ABO blood groups among participants show that group B (40.7%) was most frequent group followed by group O (27.2%), A (21.4%) and AB (10.7%). Kanwal S et al at medical and dental college Lahore has published similar finding in which group B (40.45%) was the most recurrent group tailed by group O (31.06%), A (20.38%) and AB (8.09%) (14) which are in conformity with our data. Results of a study from district swat also indicate the comparable drifts of frequency of ABO blood group to our work (10).

It has been reported from Rawalpindi that B positive was the most common blood group pursued by O positive (29.7%), A positive (21.5%), AB positive (9.8%), B negative (2.9%), O negative (2.5%), A negative (1.8%) and AB negative (0.6%)(15), these finding are in line with the given work regarding the distribution of ABO groups among Rh-D positive and Rh-D negative.

A study done by Kanwal S et al. described 89.48% frequency of Rh-D positive and 10. 52% of Rh-D negative(14)which exhibit lower frequency of Rh-D positive contrast to current study and higher frequency of Rh-D negative. The possible explanation of this contradiction is the large sample size of kanwal S et al.

Our limitations include the small sample size of the study and detection of blood grouping on only forward method.

CONCLUSION

It has been concluded that a large number of adult female students are facing the hypocalcaemia, while blood group B is the most dominant group in the female students of IPMS-KMU.

REFERENCES

1. Peacock M. Calcium metabolism in health and disease. Clinical Journal of the American Society of Nephrology. 2010 Jan 1;5(Supplement 1):S23-30.
2. Lanham-New SA. Importance of calcium, vitamin D and vitamin K for osteoporosis prevention and treatment: Symposium on 'Diet and bone health'. Proceedings of the Nutrition Society. 2008 May;67(2):163-76.
3. Liamis G, Milionis HJ, Elisaf M. A review of drug-induced hypernatraemia. NDT plus. 2009 Oct 1;2(5):339-46.
4. Thacher TD, Smith L, Fischer PR, Isichei CO, Cha SS, Pettifor JM. Optimal dose of calcium for treatment of nutritional rickets: a randomized controlled trial. Journal of Bone and

Mineral Research. 2016 Nov 1;31(11):2024-31.

5. Hoffbrand AV, Moss PA. Essential haematology. John Wiley & Sons; 2011 Nov 28.
6. Rahman M, Lodhi Y. Frequency of ABO and Rhesus blood groups in blood donors in Punjab. Pak J Med Sci. 2004;20(4):315-8.
7. Sigmon JM. Basic principles of the ABO and Rh blood group systems for hemapheresis practitioners. Journal of clinical apheresis. 1992 Jan 1;7(3):158-62.
8. Ilyas MU, Iftikhar MU, Rasheed US. Frequency of ABO and Rh blood groups in Gujranwala (Punjab), Pakistan. Biologia (Pakistan). 2013;59(1):107-14.
9. Patel P. Frequency and distribution of blood groups in blood donors in western Ahmedabad–a hospital based study. blood. 2011 Dec.
10. Khattak ID, Khan TM, Khan P, Shah SM, Khattak ST, Ali A. Frequency of ABO and Rhesus blood groups in District Swat, Pakistan. J Ayub Med Coll Abbottabad. 2008;20(4):127-9.
11. Junaid K, Rehman A, Jolliffe DA, Wood K, Martineau AR. High prevalence of vitamin D deficiency among women of child-bearing age in Lahore Pakistan, associating with lack of sun exposure and illiteracy. BMC women's health. 2015 Dec;15(1):83.
12. Khan AH, Naureen G, Iqbal R, Dar FJ. Assessing the effect of dietary calcium intake and 25 OHD status on bone turnover in women in Pakistan. Archives of osteoporosis. 2013 Dec 1;8(1-2):151.
13. Greiner R, Konietzny U. Phytase for food application. Food Technology & Biotechnology. 2006 Apr 1;44(2).
14. Kanwal S, Qureshi HJ, Aslam MS, Masood S. Frequency of ABO and Rh blood groups in students of AkhtarSaeed Medical and Dental College, Lahore. Pak J Physiol. 2016;12(1):29-30.
15. Khan MS, Farooq N, Qamar N, Tahir F, Subhan F, Kazi BM, Fiyaz M, Karamat KA. Trend of blood groups and Rh factor in the twin cities of Rawalpindi and Islamabad. JOURNAL-PAKISTAN MEDICAL ASSOCIATION. 2006 Jul;56(7):299. Khan MS, Farooq N, Qamar N, Tahir F, Subhan F, Kazi BM, et al.