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Benign Prostatic Hyperplasia and its Association with ABO Blood Group System

SPECIALITY: UROLOGY

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Abstract

Benign prostatic hyperplasia (BPH) is the most common prostate problem in aging men in the present scenario. Several factors like imbalance in androgen secretions, obesity and life style modifications are linked to the incidence of occurrence for BPH. However, the role of blood group system in BPH prevalence is under research. The current study was done to find the association between ABO blood group system/Rh factor and the incidence of benign prostatic hyperplasia. A case control study was done from the medical case records of diagnosed BPH subjects in the urology inpatient department. From the case record, the distribution of the A, B, O and AB blood groups, Rh factor in BPH subjects were collected and analysed the distribution of various blood groups. Rh -ve individual are indeed having a significant associated with a lower risk of BPH when compared to Rh +ve population. Incidence of BPH was O > B > A > AB among the study groups. However, it was not statically significant. This study shows that Rh +ve individuals are more prone for BPH when compared to Rh -ve individuals. Additional studies to be done to elucidate the molecular mechanism to find the link between blood group system and BPH.

Key Words: *ABO blood group, Rh factor, benign prostatic hypertrophy.*

Introduction

Benign prostatic hypertrophy or hyperplasia (BPH) is a non-malignant urological disorder in men due to an enlargement of a prostate gland. Clinical manifestations include obstruction in urine flow, discomfort and pain during urination. Prevalence of BPH accounts nearly 8% of men aged between 45 - 50 years and when men cross 80 years of age the prevalence rate is almost 80%. Most common complications of BPH are urinary retention, urinary tract infections (UTIs), bladder stones, bladder damage and it may end up with kidney damage. As per American urological association guideline, BPH is one of the ten major diseases in men older than 50 years of age. Incidence of BPH also shows a great geographical disparity where black people are more susceptible when compared to white. Additionally, BPH is more common in Caucasians and Jews when compared to people in far east [(1)]. Similarly,

vegetarians are more prone to BPH when compared to non vegetarians[2]. Few studies have documented that more 80 percent of aged Indian men suffer from BPH [3]. Hence, in India, among various urological disorders, benign prostatic hypertrophy (BPH) is a growing public health concern in aging men.

In human population, ABO and Rh blood group system plays a vital role in transfusion and transplantation medicine. Beyond their clinical significance, several reports has been documented that existence of a significant relationship between blood group systems to various pathological states. Available literature indicates that increased risk of cancers at twenty different sites like breast, pancreas, liver etc has been linked to a particular type of blood group (A or B or O or AB)(4). Another study shows a strong correlation in prevalence of coronary artery disease to A group individuals [5]. In the same manner, proven results shows O group people are more prone to cerebro vascular diseases [6]. Added to it, non AB group persons are more susceptible for gestational diabetes [7]. Similarly, a strong correlation was observed between ABO blood group and personality traits in Japanese healthy subjects [8]. In another study it was observed that O group individual are at higher risk for rotator cuff tear [9]. Another research article shows, there is positive correlation in ABO blood group system and blood borne infection in Iranian population [10]

Hence, from the available literature it is clear that there is a significant correlation between blood group system and various diseases. However, a very few scientific evidences are available to prove the existence of relationship between various blood group system and prostate disorders. Hence, this study was initiated to find incidence of association between ABO blood group system and benign prostrate hypertrophy.

Methodology

A case control study was done at a well established hospital at Chennai, India. After getting an approval from the institutional ethical committee, the study was initiated. A data collection was made from the medical case records of diagnosed BPH subjects those who were admitted in the urology department between 1st January 2010 –31st December 2014. Selection of case records were taken from the subjects aged between 50 – 70 years with nil/minimal co morbidity conditions. From the case record, the distribution of the A, B, O and AB blood groups, Rh factor in BPH subjects were evaluated to find the distribution of various blood groups.

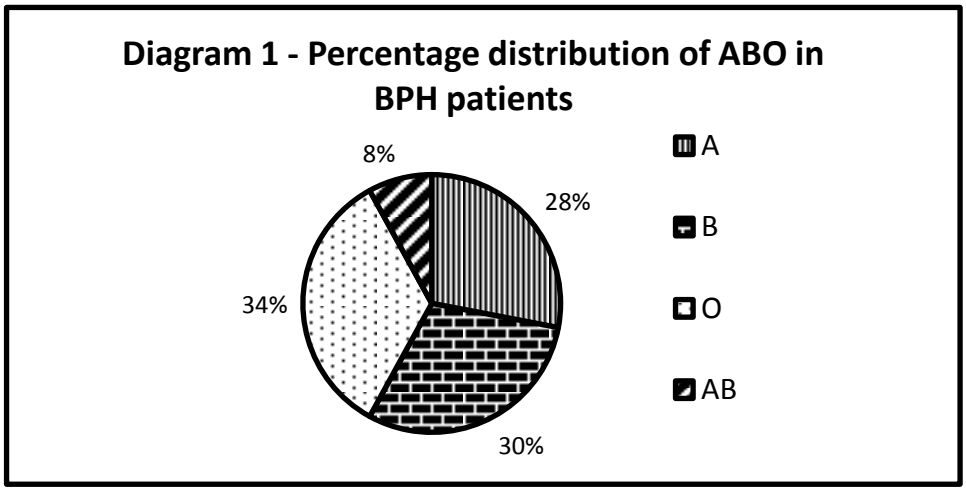
Statistical Analysis

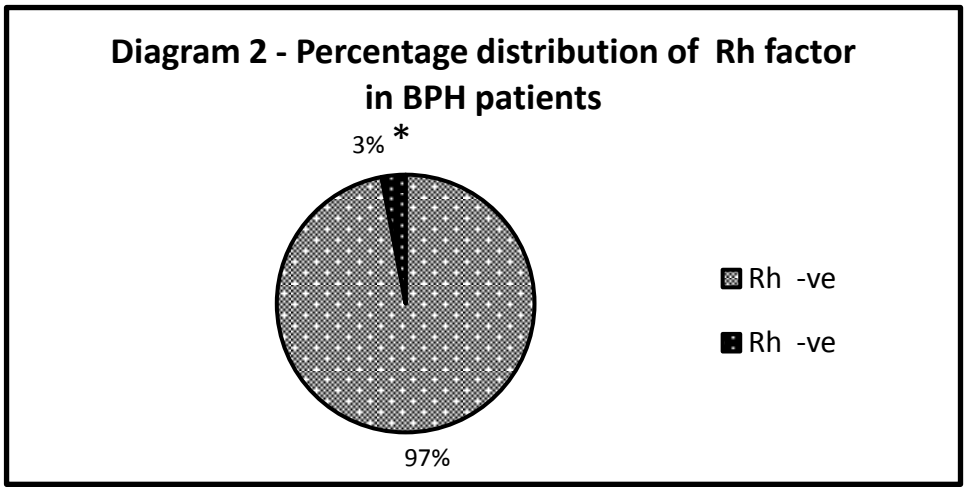
The blood group distribution among BPH subjects were compared by single variable non parametric Chi-square test using SPSS software for windows version 21.0 (Armonk, NY, IBM Corp.). The *p* value < 0.05 was considered statistically significant.

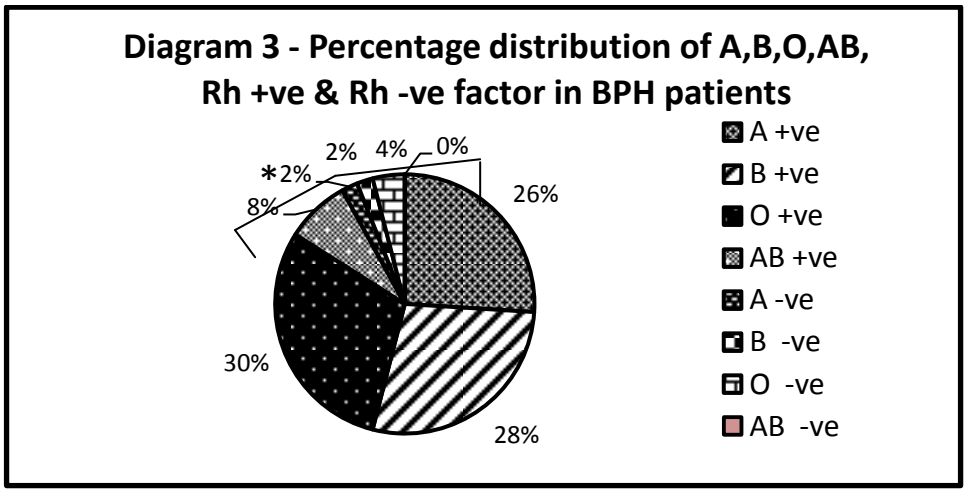
Results

In the current study we find that distribution of Rh -ve individual are indeed having a significant associated with a lower risk of BPH when compared to Rh +ve population (Diagram 2 and 3). Additionally, it was also observed that AB -ve BPH subjects were the least affected study population when compared to other groups. Incidence of BPH was observed as O > B > A > AB among the study groups. However, it was not statically significant (Diagram 1).

Diagram 1,2 and 3 : Percentage distribution of ABO blood group and Rh factor in BPH subjects







ABO and Rh factor occurance in BPH subjects expressed in percentage. * indicates *p* value < 0.05 was considered to be significant (single variable non parametric Chi-square test).

Discussion

This prospective study carried out within a well-defined case control diagnosed BPH subjects in south Indian population. In the past five decades several studies has been documented in the existence of an association between ABO/Rh

blood type and various diseases. Idea behind for the initiation of the study is due to ABO antigens apart from its expression in red blood cell membrane it is also expressed on the surface of a number of human cells and tissues. Several studies have documented involvement of blood group antigen in the development of various life threatening diseases from cardiovascular ailments to cancer.

Benign prostate hypertrophy/hyperplasia is one of the most common disease that occur in older men across the globe. There are several well-known etiological factors for the development BPH like permissive role androgens, aging etc. Moreover, in general, hyperplasia in the transitional zone of the prostate gland is an index for BPH. Several life style activities like irregular bowel habits, voiding nature of urine can increase the risk of prevalence of BPH. However, the role of blood group for the development of BPH is not clear. Hence, this study was initiated to find the association between ABO blood group and Rh factor to BPH. In the current study, it was found that there was no significant variation among ABO blood group to BPH, which in agreement with an earlier study where it was found that no association with blood group and BPH (11, 12). However, the variations in individual group (even though it was not significant) which could be due to ABO blood group-driven regulation of circulating levels of several proinflammatory and adhesion molecules (i.e., soluble E-selectin, P-selectin, and intercellular adhesion molecule-1). In another study, O group individual are at higher risk for biochemical recurrence in radical prostatectomy patients (13). Similar findings were observed in prostate cancer patients for the development of tumorigenesis process (14-16). Additionally, present study also reports that Rh +ve are at a greater risk for BPH when compared to Rh +ve population. The probable reason could be due to similar mechanism as mentioned above. The other possible reason could be due variation in the normal distribution of ABO and Rh-D blood groups which is concurrent with a pervious study where they found that Rh –ve individuals distribution was 6% when compared to Rh +ve normal individuals (17). The other possible reason for the our result could be due to ethnic variations in distribution of blood group or due other metabolic factors associated with BPH (18).

Study limitations

Our study was done in a smaller population in a particular ethnic region and further large cohort studies, including different countries and regions, would clarify the association between ABO blood groups and BPH.

Conclusion

Although no definitive, conclusions can be drawn from this strictly observational investigation. The Rh +ve individual are at a higher for BPH. Our findings may pay way for a new molecular level research in relation to blood group that could improve the present understanding of the pathophysiology of BPH.

References

1. Fenter TC, Naslund MJ, Shah MB, Eaddy MT, Black L. The cost of treating the 10 most prevalent diseases in men 50 years of age or older. The American journal of managed care. 2006;12(4 Suppl):S90-8. Epub 2006/03/23.
2. Green J. Vegans, vegetarians and BPH. BJU international. 2000;85(1):171. Epub 2000/02/26.
3. Josephine A. Clinicopathological study of prostatic biopsies. Journal of clinical and diagnostic research : JCDR. 2014;8(9):FC04-6. Epub 2014/11/12.
4. Zhang BL, He N, Huang YB, Song FJ, Chen KX. ABO blood groups and risk of cancer: a systematic review and meta-analysis. Asian Pacific journal of cancer prevention : APJCP. 2014;15(11):4643-50. Epub 2014/06/28
5. Lee HF, Lin YC, Lin CP, Wang CL, Chang CJ, Hsu LA. Association of blood

group A with coronary artery disease in young adults in Taiwan. Internal medicine (Tokyo, Japan). 2012;51(14):1815-20. Epub 2012/07/24.

6. De Marco M, Venneri A. 'O' blood type is associated with larger grey-matter volumes in the cerebellum. Brain research bulletin. 2015. Epub 2015/05/26.
7. Zhang C, Li Y, Wang L, Sun S, Liu G, Leng J, et al. Blood group AB is protective factor for gestational diabetes mellitus: a prospective population-based study in Tianjin, China. Diabetes/metabolism research and reviews. 2015. Epub 2015/03/31.
8. Tsuchimine S, Saruwatari J, Kaneda A, Yasui-Furukori N. ABO Blood Type and Personality Traits in Healthy Japanese Subjects. PloS one. 2015;10(5):e0126983. Epub 2015/05/16.
9. Lee DH, Lee HD, Yoon SH. Relationship of ABO Blood Type on Rotator Cuff Tears. PM & R : the journal of injury, function, and rehabilitation. 2015. Epub 2015/05/06.
10. Mohammadali F, Pourfathollah A. Association of ABO and Rh Blood Groups to Blood-Borne Infections among Blood Donors in Tehran-Iran. Iranian journal of public health. 2014;43(7):981-9. Epub 2015/04/25.
11. Bourke JB, Griffin JP. Hypertension, diabetes mellitus, and blood groups in benign prostatic hypertrophy. British Journal of Urology. 1966;38(1):18 - 23.
12. Beasley WH. The ABO blood groups of carcinoma of the oesophagus and of benign prostatic hyperplasia. Journal of clinical pathology. 1964;17:42-4. Epub 1964/01/01.
13. hno Y, Ohori M, Nakashima J, Okubo H, Satake N, Takizawa I, et al. Associations between ABO blood groups and biochemical recurrence after radical prostatectomy. International journal of clinical and experimental medicine. 2015;8(2):2642-8. Epub 2015/05/02.
14. Franchini M, Lippi G. The intriguing relationship between the ABO blood group, cardiovascular disease, and cancer. BMC medicine. 2015;13:7. Epub 2015/01/17.
15. Liumbruno GM, Franchini M. Hemostasis, cancer, and ABO blood group: the most recent evidence of association. Journal of thrombosis and thrombolysis. 2014;38(2):160-6. Epub 2013/11/16.
16. Pace G, Di Massimo C, De Amicis D, Vicentini C, Ciancarelli MG. Inflammation and endothelial activation in benign prostatic hyperplasia and prostate cancer. International braz j urol : official journal of the Brazilian Society of Urology. 2011;37(5):617-22. Epub 2011/11/22
17. Das P K , Nair S C, Harris V K, Rose D, Mammen J J, Bose Y N, et al. Distribution of ABO and Rh-D Blood Groups among Blood Donors in a Tertiary Care Centre in South India. Trop Doct 2001;31:147 - 48.
18. Parsons JK, Carter HB, Partin AW, Windham BG, Metter EJ, Ferrucci L, et al. Metabolic factors associated with benign prostatic hyperplasia. The Journal of clinical endocrinology and metabolism. 2006;91(7):2562-8. Epub 2006/04/13