

The Influential Incidence and Prevalence of Angiohemophilia

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Authors' contributions

This work was carried out in collaboration among all authors. Author KSS designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors AMK and SKA managed the analyses of the study. Author SKA managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Background: Angiohemophilia (VWD) is a common human inherited disease where the parent carrying the gene may or may not be symptomatic. VWD is an illness of the blood that does not coagulate correctly. Blood contains numerous proteins to stop the bleeding of the body. Von Willebrand factor VWF is one of these proteins.

Aim: Current study was planned to classify the prevalence of VWD between 2014 and 2019 in Nineveh province.

Materials and Methods: The study included 829 patients, 365 of which were carriers of one or more hemophilia factors deficiency. Special Staco kit was used for detecting VWF.

Results: Thirty out of 365 patients were diagnosed with VWD. The association between VWD and other associated variables is not significant. An acceptable value was found between age and blood type.

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Conclusion: The origins of families that hold the disease mutant gene must be tracked, births taken and infection mitigation techniques used in these families established. Do not neglect the value of the sort of blood that affects the VWD directly.

Keywords: VWD; angiohemophilia; von willebrand factor; hemophilia.

1. INTRODUCTION

The world's population is ageing and a major rise in hemostatic symptoms is correlated with a rising trend in the direction of hypercoagulation. Angiohemophilia is a common human hemorrhaging condition. It is an inherited disease where the parent carrying the gene may or may not be symptomatic. Any patients with the disorder are born with it by a relative or both [1]. Warning symptoms cannot occur for years following a dental operation, for example after serious bleeding, though. The core characteristic of all types of von Willebrand disease (VWD) is that the bloodstream includes decreased von Willebrand factor (VWF) levels or anomalous forms of VWF. The most prevalent form of bleeding disorder is VWD which affects up to 1% of the world's population. VWF has similar observational effects, provided, however, that chronic inflammatory conditions and endothelial disturbedness have a substantial impact on VWF and release synthesis, and the majority of blood clotting factors, such as fibrinogen, FV(factor number 5), FVII (factor 7) and FX (factor 10), have increased over time¹ and platelet reactivity and activation in vivo [2].

1.1 VWD in Children

Children with VWD may have different effects than the gene-carrying parent. This hemorrhage disease is widespread in women. In women who have VWD, menorrhagia is found in more than 70% and dysmenorrhea in one percent. A major multimeric glycoprotein in plasma is the willebrand factor (VWF). The endothelium, α -granules of the platelets (megakaryocytes) and the sub-endothelial attachment tissue are synthesized in Weibel-palade bodies [3].

1.1.1 Types of VWD

VWD has been listed by the International Thrombosis and Homeostasis Community on the basis of qualitative and quantitative defects. They are: heritage shapes and type gained. Three main styles and one platelet type are inherited varieties. Type 1, Type 2 and Type 3 are the three primary types. The VWD type 2 is

further categorized in four distinct forms, including type 2A, type 2B, type 2M and type 2N, according to this classification [4].

If the gene is passed on to the descendants of each parent Type 1 and Type 2 are inherited. Form 3 can only be passed if both parents transfer the gene. Patients of auto anticorps are seen with acquired VWD [5].

1.1.1.1 Type 1 VWD

Type 1 VWD manifests mild mucocutaneous bleeding. Blow-up and epistaxis are the most common symptoms. Women undergo severe menstrual bleeding and severe blood loss after childbirth in reproductive years. The disease symptoms can be more severe if the levels of VWF are less than 15 IU/dl.

1.1.1.2 Type 2A VWD

Type 2A VWD individuals usually manifest mild to moderate mucocutaneous bleeding. Usually 2B VWD has mild to severe mucocutaneous bleeding. Thrombocytopenia that gets worse during stress may be found. The signs of type 2N VWD are close to those of moderate hemophilia A, including severe bleeding during the surgery. Acquired VWD people also suffer from moderate to mild bleeding [6].

Most VWD cases are related to the family history of severe bleeding which is also exposed. However, some types of the disease have inadequate penetration of the bleeding signs, complicating this problem. The disorder is a key feature in most cases. The extreme type 3 disorder, by comparison, demonstrates a recessive ancestry trend and parents typically do not have clinical symptoms [7].

1.2 Diagnosis

The clinical diagnosis of VWD is heavily focused on an empirical personal experience of excessive mucocutaneity. In the general population also many bleeding signs are found in VWD. Although a typical clinical history could recognize patients with an abnormal tendencies

to bleed, there are now reasonably short and reliable questionnaires for bleeding, which will help to recognize and classify 'serious bleeders'. The diagnosis of VWD needs exposure to three components in the clinic and the laboratory: a prior history of excessive MCS (Mental Component Summary), a family history of excessive bleeding and a laboratory examination in keeping with a quantitative and/or qualitative VWF (von Willebrand factor) defect. The essential components of VWD diagnosis include quantitative and qualitative measures of VWF and FVIII in the hemostasis laboratory [8,9].

1.3 Acquired VWD

This does not inherit VWF's function but soon removes the antibody complex from circulation. The disorder is diverse. Typically, the VWF is produced and eliminated by tumor cell adhesion or broad multimer interference or protein digestion, mediated by VWF antibody from circulation. VWD can be established and gazelle bleeding in patients with aortic stenosis [10].

1.4 VWF Physiology

VWF is only involved in strong flow and shear stress environments. Therefore, organs with large vessels like the eyes, womb and gastrointestinal tract show factor deficiency. This can be used for the pathophysiology for multiple types of VWD [11].

1.5 Treatment

Treatment with VWD will usually consist of two types: ancillary therapy to give indirectional weather gain and therapy to improve VWF and FVIII plasma levels. There are several standard guidelines for VWD counseling. VWD is a substitute of defective protein (VWF) as the core of therapy. Non-related therapy, replacement therapy, and other medications are various remedies for VWD. Antifibrinolytics are used for VWD treatment of aminocaproic acid and tranexamic acid. It prevents the conversion and thereby inhibits fibrinolysis of plasminogen to plasmin. Medications should be used either orally or intravenously in people with VWD to treat minor mucocutaneous bleeding [12].

According to the increase in the number of people with von Willebrand disease, our study focused on detecting the prevalence of VWD in Mosul and its suburbia. The current study was

performed between November 2014 and November 2019.

2. MATERIALS AND METHODS

This study was carried out at the Ibn-Sina Teaching Hospital. Blood samples were collected from patients under study from November 2014 and November 2019. Patients subjected to initial clinical evaluations were obtained from blood samples. The current study included of total 829 suspected patients under examination who had a deficiency of one or more factors causing hemophilia. Angiohemophilia studies have been performed. Special Stago kit has been used. Stago STart Hemostasis Analyzer Labx - Canada was used for the testing. The research is based on the theory of coagulation. ABO (RH) determinants are also expressed on several different platelet surface glycoprotein receptors. The determination factor is the measurement factor and the duration of coagulation is in reverse proportion to the concentration of the measured agent. The inverse linear relation of the concentration measurement factor to the required coagulation time exists on a logarithmic graph paper. There are 829 patients taking part in this report. The age of the patient is divided into four groups: (1-20 y, 21-40 y, 41-60 y, and 61-80 y).

The expert physician report not only evaluated the deficiency of the factor in the patient family, but also decided whether a prior case of hemophilia existed among the patient's family, according to data developed and the medical history of the patient. SPSS version 25 was used for the statistical analysis. One-way ANOVA has been applied to compare variables and factor (VWD, genders, ages and blood groups) with significant values.

3. RESULTS

A 829 patients under investigation were included in the current study. 365 of these have been reported to be ineffective in one or more distinct cases of hemophilia. In these, 30 von Willebrand disease patients have been diagnosed, some of which are deficient for more than one hemophilia cause. Statistical variations including mean, standard error, and standard deviation are between VWD and variables illustrated in Table 1. The standard error was calculated between VWD and age groups.

Table 1. Mean, standard error and standard deviation of parameters

Variable	No. of sample size	Min.	Max.	Mean	Std. error	Std. deviation
VWD	30	39	76.00	32.6120	5.72275	31.34478
Age	30	1	4	1.51	0.032	0.605
Valid no.	30					

Table 2. Statistical values of VWD with genders

VWD/ Gender	No.	Mean	Std. deviation	Std. error
Male	12	41.8517	31.87316	9.20099
Female	18	26.4522	30.30245	7.14236
Total	30	32.6120	31.34478	5.72275

Table 3. Statistical values of VWD with age groups

VWD/ Age group	No.	Mean	Std. deviation	Std. error
1-20 y	23	31.8826	31.39236	6.54576
21-40 y	7	35.0086	33.56424	12.68609
Total	30	32.6120	31.34478	5.72275

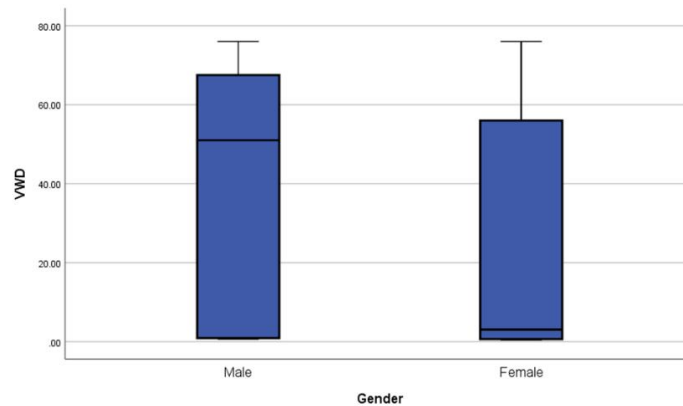


Fig. 1. VWD vs gender shows elevation number of male than female

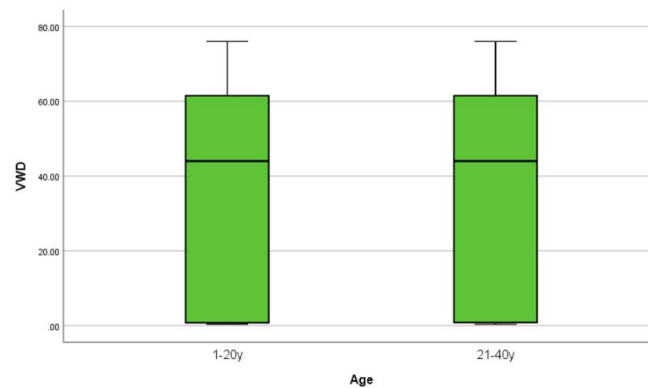


Fig. 2. VWD vs age groups shows elevation number the first two groups (1-20y and 21-40y)

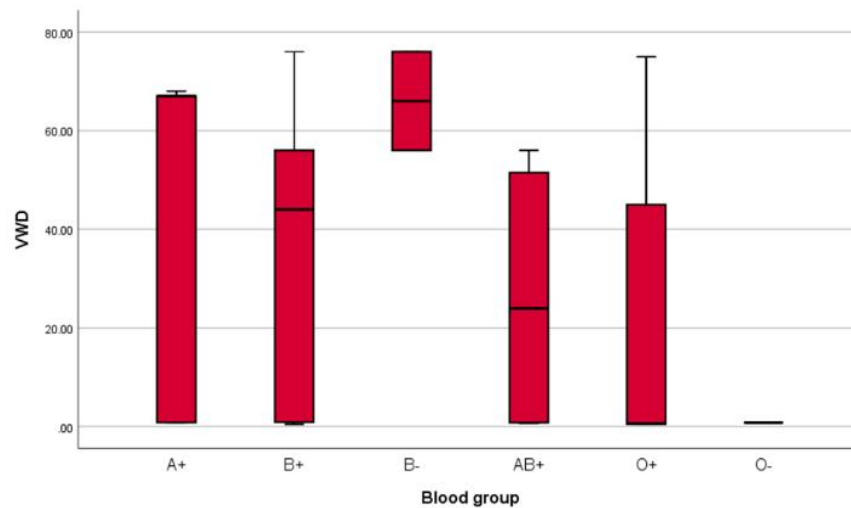


Fig. 3. VWD vs blood groups shows elevation number in the blood group (B⁺)

Table 4. Statistical values of VWD with blood groups

VWD/ Blood group	No.	Mean	Std. deviation	Std. error
A ⁺	5	40.7100	36.45779	16.30442
B ⁺	13	31.9954	31.06120	8.61483
B ⁻	2	66.0000	14.14214	10.00000
AB ⁺	4	26.1350	29.51887	14.75943
O ⁺	5	24.3060	34.26698	15.32466
O ⁻	1	8000	.	.
Total	30	32.6120	31.34478	5.72275

Table 5. Significant correlation between variables under pearson test. *: Correlation is significant at the 0.05 level (2-tailed)

Variable		Gender	Age	Blood group	VWD
Gender	Pearson correlation	1	-0.019	0.016	-0.245
	Sig. (2-tailed)		0.713	0.759	0.192
	No.	365	365	365	30
Age	Pearson correlation	-0.019	1	0.104	0.043
	Sig. (2-tailed)	0.713		0.047	0.822
	No.	365	365	365	30
Blood group	Pearson correlation	0.016	0.104	1	-0.210
	Sig. (2-tailed)	0.759	0.047		0.266
	No.	365	365	365	30
VWD	Pearson correlation	-0.245	0.043	-0.210	1
	Sig. (2-tailed)	0.192	0.822	0.266	
	No.	30	30	30	30

The findings show that the number of afflicted male with this disease was higher than that of female, as seen in Fig. 1. Table 2 shows the statistical details and the correlation.

(41-60 y) and (61-80 y), shown in Fig. 2. The statistical analysis is shown in Table 3. The standard error was calculated between VWD and genders.

The results revealed that the most vulnerable ages fall within the groups (1-20 y) and (21-40 y) for the VWD, while no cases were recorded ages

According to the statistical analysis, the highest number of blood group (B⁺) was detected for VWD while other groups got less that, Fig. 3. No

case of VWD for blood group (AB⁻) has been reported in our records. Table 4 displays statistical values between VWD and blood groups. The standard error was calculated between VWD and blood groups.

Our data show no significant correlation among VWD and other related variables based on the Pearson correlation in 2-tailed (gender, age and blood group). A relevant value between age and blood group with $P < 0.05$ was observed during the current analysis Table 5.

4. DISCUSSION

The VWF defect entered 30 patients at a rate of 8.2% of the hemophilia cases. Since hemophilia is associated with the X chromosome, it is possible for men to have more than women afflicted with all causes except VWF, of which women were more affected than men.

The most of studies have found that von Willebrand (VWD) has been present in men and women with an equitable incidence, affecting up to 1% of the total population. However, the increased bleeding caused by women after menses, during breastfeeding and during delivery are more vulnerable to VWD symptoms. More than 14,600 adults, women and children visited VWD care centers for hemophilia from 2012 to 2016. Women and girls were nearly 2/3 of the total infection [13-16].

While aging has well defined the impact of ageing on the hemostatic system of healthy individuals, its effects on VWF levels of VWD patients is poorly characterized. Just one experiment in a small group (n=31) of VWD patients over a total of 11 years found that VWD-1, which can result in full normalization of the hemostatic parameter, is a patient with age-related VWF rises. This is attributed to the medium 11 years [17]. The most fragile ages between 1-40 years is documented and this has been recorded realistically in most of the studies [18]. Another research has shown that the parameters of VWF and bleeding phenotype improve in VWD with age rising. In type 1 patients without bleeding phenotype diminishments, levels VWF and FVIII rise with age. VWF parameters do not rise with age in type 2 patients and elevated bleeding happens in these patients [19]. A research that has shown aging is related to decreased symptoms of bleeding, but has not found a connection between aging and increased VWF levels [20,21]. Another research has shown that the

association of age and the VWF ratio between age and functional VWF is not important [22]. Our results are consistent with this report.

A series of studies show that the blood group ABO influences VWF plasma concentrations. In a large sample, 66% of the overall plasma VWF variants were genetically determined and 30% were genetically determined. ABO blood group portion has been clarified [23]. The effect of ABO blood type and ethnicity on plasma VWF levels has been observed and found that the levels of Caucasians are slightly lower than those of African Americans. Interestingly enough, ABO and race have separately seen results, which make up 19% and 7% of the overall VWF: Ag level [24]. A population-based patient monitoring research on 301 consecutive patients and 301 controls is carried out by Koster in order to explain the role of ABO blood types, VWF and FVIII in the mechanism of deep vein thrombosis [25]. In this study, we observed that most VWD patients are blood type B⁺ while the lower blood groups were A⁺, O⁺, and AB⁺. This is consistent with previous researches. For the blood group O⁻, as far as the lowest rates are concerned, the blood group B⁻ did not register in either situation. Unfortunately, our research has not provided for a systemic calculation of the seriousness of the bleeding phenotype of our cohort, for example by means of a standardized bleeding evaluation instrument, or to further examine the impact of aging on VWF levels in patients with genetically validated VWD and with varying VWF mitigation mechanisms.

5. CONCLUSION

Genetic research for the treatment of families with inherited bleeding disorders, including VWD, is evolving, in assisting patients, test centers and experts play a crucial role. Despite the scientific advances in clinical studies in bleeding disorders, professional physicians and laboratory scientists with haemostasis skills are also needed. For haemostasis specialists training opportunities must be created. The origins of the families bearing the mutant gene carrying the disease need to be tracked, the births taken up and the strategies used to mitigate infections in these families must be determined. And don't ignore the significance of the blood type that specifically affects the VWD type.

CONSENT AND ETHICAL APPROVAL

This work was approved by the ethical committee of Nineveh Health Foundation (SR

203).The consent forms were filled by the patients and approved the specialized physician.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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