The Relationship Between AB0 Blood Group and Deep Venous Thrombosis

AB0 Kan Gruplarıyla Derin Ven Trombozu Gelişimi Arasındaki İlişki

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ABSTRACT Objective: Deep venous thrombosis (DVT) may cause serious health problems such as pulmonary embolism and extremity lose because of broken circulation. So prophylaxis and treatment becomes valuable. This study aims to show that the relationship between ABO blood type and deep venous thrombosis. **Material and Methods:** This study included the patients with DVT who had treated between january 2011 to december 2013 in our hospital. The documentaries searched retrospectively from hospital's archive and the patients chose from who had DVT in lower extremity and shown by Doppler USG. The control group rendered randomly with the patients who treated without inpatient treatment and hadn't gotten DVT. Exclusion criteria were DVT with malignity, immobility, trauma, pregnancy. FV Leiden mutation, FVIII and vWF tests didn't include to study's data because of not to working this inspections routinely. The patient's blood group compared with the control group's blood type. **Results:** Although AB blood group were significantly high in the cases (p=0,039); A, O and B types hadn't any relationship with DVT. Nonetheless age, sex, Rh antigen, diabetes mellitus, chronic obstructive lung disease were unrelated. **Conclusion:** This study shows that AB blood type has elevated risk for DVT.

Key Words: ABO blood-group system; venous thrombosis

ÖZET Amaç: Derin ven trombozu (DVT) pulmoner emboli ve sonrasında ölüm görülebilecek, bozulmuş kan dolaşımı nedeniyle ekstremite kaybına sebep olablecek ciddi bir hastalıktır. Bu nedenle hastalığın önlenmesi ve tedavisi önem kazanmaktadır. Bu çalışmada DVT oluşumu ile kan grupları arasındaki ilişkiyi araştırmayı amaçladık. **Gereç ve Yöntemler:** Hastanemizde Ocak 2011-Aralık 2013 tarihleri arasında polikliniğe başvurarak Doppler USG sonucuna göre DVT tanısı konmuş hastaların verileri retrospektif olarak incelendi. Alt ekstremite derin venöz sistemde trombüsü olan ve klinik kayıtlarında hasta bilgilerine ulaşılabilen hastalar çalışmaya dahil edildi. Kontrol grubu olarak çalışmaya dahil edilen 70 hasta kalp damar cerrahisine başvuru yapıp venöz trombozu olmayan ve ayaktan tedavi görebilecek hastalar arasından randomize şekilde seçildi. Malignite, immobilite, santral venöz kateteri olan hastalar, travma ve gebelik sonrası oluşan DVT'li hastalar çalışma dışında tutuldu. Rutin olarak bakılmayan ve dolayısıyla retrospektif incelemeyle belirlenemeyen FV Leiden gen mutasyonu, FVIII ve vWF değerleri çalışma verilerine dahil edilmedi. Hastaların kan grupları kaydedildi. Kan grupları ve diğer hasta özellikleri DVT ve kontrol grubunda kıyaslandı. **Bulgular:** Kan gruplarına göre yapılan değerlendirmede AB kan grubuyla DVT gelişiminin anlamlı derecede birliktelik gösterdiği belirlendi (p=0,039). Ülkemizde en sık görülen A ve O kan gruplarıyla DVT arasında anlamlı ilişki tespit edilmedi. Kontrol grubuna göre Rh faktörünün, yaşın, cinsiyetin, diyabet ve kronik obstrüktif akciğer hastalığının DVT gelişimine etki etmedikleri sonucuna varıldı. **Sonuç:** Bu çalışmada AB kan grubu olan hastalarda kontrol grubuyla kıyaslanınca DVT gelişme riskinin yüksek olduğu tespit edildi.

Anahtar Kelimeler: ABO kan grubu sistemi; venöz tromboz

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Deep venous thrombosis (DVT) may cause pulmonary embolism and brooking lower extremity blood circulation. Main causes for DVT named by virchow's triad are stasis (immobilization, varicose veins, obesity, atrial fibrillation), hypercoagulability (Factor V Leiden mutation, Homocystinuria, Herediter thrombophilia, protein C and protein S deficiency, pregnancy, surgical treatment, malignancy, hyperlipidemia) and endothelial injury (intravenous injections, central venous catheters).[1] Although this three circumstances are main justifications, there are many other inclinations for DVT like ABO blood type. In many studies shown that AB blood type has elevated FVIII and vonWillebrand Factor (vWF) from the other types and so that DVT frequency is higher in AB blood type.[2]

MATERIAL AND METHODS

This study includes 156 patients. 88 of them are the patients who diagnosed with venous doppler ultrasonography and treated because of DVT between january 2011- december 2013. The control group includes 70 patients and chose randomly from the patients who treated without inpatient treatment and hadn't gotten DVT. The exclusion criterias were DVT caused by malignancy, trauma, pregnancy, central venous catheter history, immobility. The inclusion criterias were DVT in iliac, femoral or popliteal veins which diagnosed with venous doppler USG. The documentaries about cases searched retrospectively and the patients's age, sex, other illness for example diabetes mellitus (DM), hypertension (HT), Chronic Obstructive lung disease (COLD), blood type and Rh antigens noted. Then all of these variations statistically analysed for causing DVT.

RESULTS

There were 51 male and 37 female patients in the case group and the mean age was 58.2±17.7 years. The control group comprised of 30 female and 40 male patients and the mean age was 53.7±19.9 years.

Age (p=0.165), and sex (p=0.918) both didn't have any relations with DVT statistically. 31 patients had DM (p=0.915), also it causes polycythemia because of hypoxemia, 49 patients with COLD (p=0.348) didn't accompany with DVT. Blood types have different effects on coagulation systems. FVIII and vWF ratio are higher in AB blood type from the other group and in our study found that AB blood group had elevated risk for DVT (p=0.039) but Rh antigens were irrelevant (Table 1).

DISCUSSION

In acute DVT medical treatment must be started immediately to avoid pulmonary embolism. DM may cause stenosis in arteriel systems also it is the reason of venous thrombosis by stirring up endothelial injury and elevated thrombocyte activation.[3] However in this study no relations found between DVT and DM.

TABLE 1: Potential risk factors on deep vein thrombosis (DVT).

	Case group	DVT	Total	P
Patients	70	88	135	
Sex	30 (42.9%)	37 (42%)	67 (42.4%)	0.918
Diabetes Mellitus	14 (20%)	17 (19.3%)	31 (19.6%)	0.915
A blood type	26 (37.1%)	40 (45.5%)	66 (41.8%)	0.293
B blood type	18 (25.7%)	12 (13.6%)	20 (19%)	0.067
AB blood type	**6 (8.6%)**	**18 (20.5%)**	**24 (15.2%)**	**0.039****
O Blood Type	20 (28.6%)	18 (20.5%)	38 (24.1%)	0.236
RH (+)	61 (87.1%)	84 (95.5%)	145 (91.8%)	0.080
COLD	19 (27.1%)	30 (34.1%)	49 (31%)	0.348
Age (year)	53.7±19.9	58.2±17.7	56.2±18.8	0.165

COLD: Chrnic obstructive lung disease.

At elder ages venous system dilatates by decreasing elasticity and blood circulation slowing down. Also body muscle grows down. This causes waned muscle pump effect on venous systems and over the 40th years DVT incidence raises.[4] May be because of the wide range of exclusion criteria in this study age and DVT hadn't got any relations.

For many studies venous thrombosis is higher in women than men because of obesity and oral contraceptive usage.[4] But this claim is not approved and there are some other studies shows that DVT is higher in men over 40 years old.[5] In our study there is no coupling between DVT and sex.

COLD causes polycythemia and this augmentate blood viscosity. Hyperviscosity may be the reason for DVT.[6] Although this is a rational justification; in our study we didn't find any togetherness between DVT and COLD.

Factor V Leiden mutation, activated protein C resistance, high FVIII and vWF levels are predispose to DVT.[7] Searches about blood types shows that blood types except 0 have higher FVIII and vWF levels so DVT evolution possibility is higher in except 0 types.[8,9] But Rh antigens and DVT are unrelated. In our study AB blood type had statistically elevated risk for DVT but Rh antigens hadn't any connection with DVT.

CONCLUSION

Especially AB blood type is prone to improve DVT. If there is a predisposed factor such as immobility, malignancy, oral contraceptive usage, smoking or any other with AB blood type taking prophylaxis seems rational.

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