
WARFARIN DOSING FOR PATIENTS WITH IMPLANTED MECHANICAL CIRCULATORY SUPPORT DEVICE

Жалбинова М.Р.^{1,2}, Рахимова С.Е.¹, Бекбосынова М.С.³, Андосова С.А.³ Акильжанова А.Р.¹

¹National Laboratory Astana, Nazarbayev University, Nur-Sultan city, Republic of Kazakhstan, ²L.N.Gumilyov Eurasian National University, Nur-Sultan city, Republic of Kazakhstan

³National Research Cardiac Surgery Center, Republic of Kazakhstan

madina8916@mail.ru

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Introduction: Nowadays, implantation of the left ventricular assist device (LVAD) is the alternative way for the treatment of chronic heart failure in Kazakhstan at the National Research Cardiac Surgery Center, since 2011. Antithrombotic therapy usually prescribed for patients for the reduction of the pump thrombosis. However, patients have side effect of bleeding because of the incorrect dosage. Correct dosage of the warfarin therapy can be calculated according to the genotyping results for gene polymorphisms of CYP2C9 and VKORC1. The aim of the study is to identify warfarin dosage according to the genetic test results and compare to the clinical dosage.

Methods: Venous blood samples were recruited from (n=100, Case study) patients with implanted LVAD such as HW, HM2, HM3. Warfarin was prescribed according to clinical protocol of the Ministry of Healthcare of the Republic of Kazakhstan. DNA samples were extracted by PureLink™ Genomic DNA Mini Kit (Invitrogen, UK). DNA samples were genotyped by real-time polymerase chain reaction (PCR) with TaqMan probes for the gene polymorphisms: CYP2C9*2(rs1799853), CYP2C9*3(rs1057910) and VKORC1(-1639 G>A (rs9923231)). Warfarin dosage was calculated on warfarindosing.org. Study also included control group (n=95).

Results: Warfarin was prescribed after LVAD implantation (1month). The minimum dosage was 0.9mg/day, maximum 7.2mg/day and mean = 3.0 mg (Std.=1.15). According to the genetic test dosage was suggested min = 2.1mg/day, mean = 4.6mg/day, max = 7.3 mg/day (Std. = 1.17). Warfarin dosage wasn't calculated to 2patients due to their age (>18 years old). Genotyping results of CYP2C9*3 polymorphism didn't reflect mutant alleles (C/C) in both group. The statistical results are not significant (P value =0.136). Results of the gene polymorphism VKORC1(P value = 0.725) and CYP2C9*2(P value = 0.952) were not significant too.

Conclusion: Research advices to study other SNPs which will allow us to identify the reasons of thrombosis and bleeding in LVAD patients and also to study more about coagulation factors, aspirin resistance, warfarin metabolism. Study needs to add more samples to be able to compare results with other samples.