BENEFITS OF REGULAR VASCULAR ACCESS MONITORING IN DIALYSED DIABETIC AND NON-DIABETIC PATIENTS

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INTRODUCTION

In order to perform hemodialysis, the most common method used to treat advanced and permanent kidney failure, access to the circulatory system is required. The preferred haemodialysis vascular accesses (VA) are the peripheral vascular access. These are achieved through the surgical creation of an arteriovenous fistula **(AVF)** or a an arteriovenous graft **(AV graft)**.

Currently, diabetes is a leading cause of chronic kidney failure and has an increasing prevalence globally. The haemodialysis vascular access issues in DM patients are thus very pressing. Creating and maintening **vascular access** in **diabetic patients is especially difficult**. Long-term maintenance of vascular access of sufficient quality requires special care – "vascular access monitoring". The dialysis nurse plays an unsubstitutable role in vascular access care.

OBJECTIVE

Point out the fact that the vascular system of diabetics is often affected by atherosclerosis and thus the creation of a well-functioning peripheral vascular access remains difficult to achieve. Regular monitoring can reveal any imminent complications in time and thus prevent premature termination of VA.

METHODS

The empirical part of the paper was focused on peripheral VA (AVF, AV-graft), establishing their QVA through recirculation values determined by regular VA measurements (207 measurements were carried out) in 40 patients of the respective department of average age of 70 in both respondent groups (the first group included 21 DM patients, the second group included 19 patients without DM) by the respective technique in the course of six months. QVA was calculated by the following formula:

QVA = QB.(1/RX-1)
QVA – vascular access flow
QB – extracorporeal circulation effective flow
R/X – established recirculation

The QVA values were recorded in the database and subsequently processed by means of data analysis. Based on the information provided orally by F. Lopot, the clinical technician of HDS-Strahov (Praha, 2013), the AVF flow ranges between 250 ml/min and 3.0 l/min. The AV-graft flow range is considerably smaller, between 500 ml/min and 1200 ml/min.

RESULTS

The average QVA calculated for both respondent groups is 622 ml/min for AVF and 810 ml/min for AV-graft. In diabetics QVA is 535 ml/min for AVF and 825 ml/min for PBG. In respondents without DM QVA is 709 ml/min for AVF and 795ml/min for AV-graft.

The indication for recirculation measurement is in particular the verification of the new VA function, search for the cause of a drop in dialysis procedure efficiency and regular VA check focused on timely detection of potential complications. The measurement interval was set according to the current state and history of the access. For new AVF/AV-graft and decreasing flow once a month, for AVG with QVA over 600ml/min after two months, in stable and high-flow AVF after four months. The one month interval is also observed after all interventions for 3 months.

The QVA values either confirmed good VA quality or an imminent VA complication. The measure low QVA values (18 times) confirmed VA complications.

- In nine diabetics with 13 complications, namely AV-graft thrombosis (6), 4 in one respondent and 2 in another, 3 AVF and AVF stenosis, 3 in one patient and 1 with AVF thrombosis
- In 3 respondents without DM we encountered 5 complications, 4 with AVF stenosis, 3 in one patient, and 1 with AVF thrombosis.

CONCLUSION

The research has confirmed that DM has a negative impact on VA by showing more frequent complications in DM respondents than in respondents without DM. VA thrombosis emerged mostly in DM respondents and VA stenosis was the most frequent complication in respondents without DM.

We attempted to point out the fact that regular VA monitoring facilitates prevention of potential complications, maintaining VA lifespan for the longest possible time and thus ensures efficient dialysis while maintaining the patient's quality of life at the highest possible level. The current trend is increased interest in functional characteristics of the respective VA types. This is good news; however, there are still many dialysis centres that are only just learning about this issue and selecting the correct procedure taking into account the technical possibilities of their workplace and the healthcare staff knowledge. We can only recommend VA monitoring as there is no quality dialysis and a satisfied patient without quality vascular access and complex care based on team cooperation.

Chart No. 1: Number of respondents with DM and without DM who presented with complications (thrombosis, stenosis) out of the total respondent number.

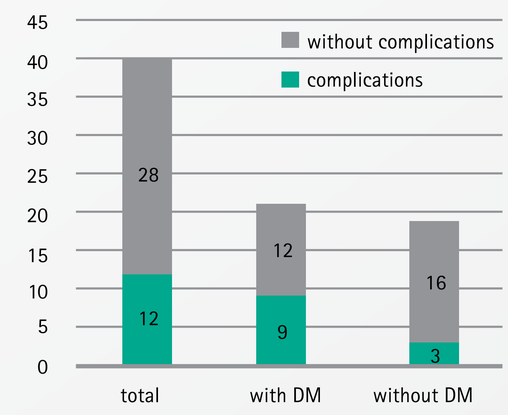


Chart No. 2: Occurrence of VA complications in both respondent groups.

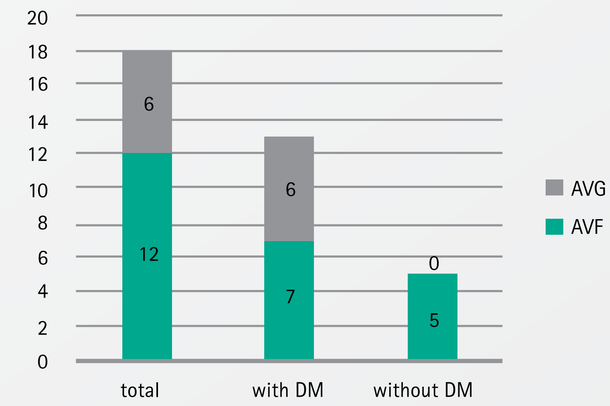


Chart No. 3: Occurrence of VA thrombosis in both respondent groups.

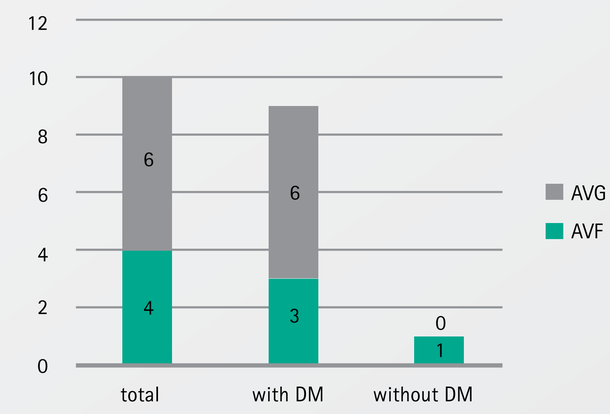


Chart No. 4: Occurrence of VA stenosis in both respondent groups.

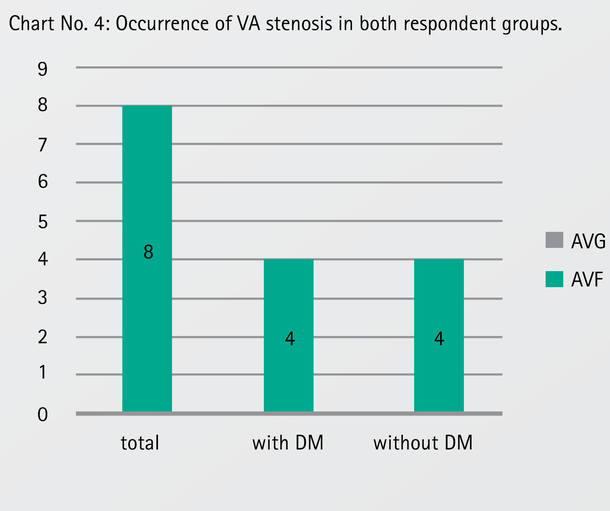
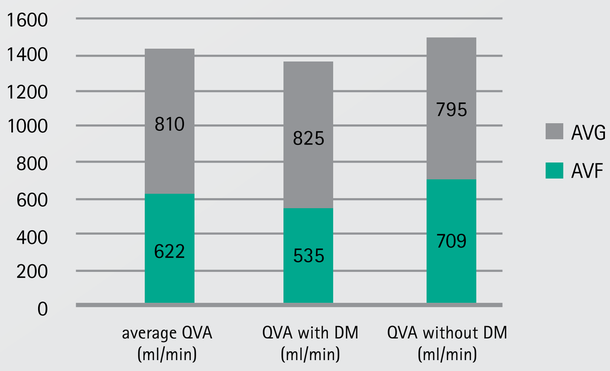


Chart No. 5: Average VA blood flow in both respondent groups.



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