Patients at risk of VND quotation

Venous needle dislodgement is a potentially life-threatening complication of dialysis that can happen to anyone in any dialysis setting throughout the world.

Patients with a well functioning AV fistula e.g. p> 25mmHg, amounts to 50% of all AV fistulas.

Low-Poor lighting in the room

Patients experiencing restlessness towards the end of the dialysis Restlessness throughout

Patients with frequent blood pressure drops or muscle cramps

Patients covering the access during dialysis this include ex. Patients who are cold, sleeping typically patients in beds

Patients with extensive hair growth around the access points which makes fixation of the needles more difficult. Patients with skin conditions, ex. Allergies to patches, eczemas, extensive sweating

Patients with history of VND

Patients who are mentally, cognitive, neurological impaired Ex. Dementia, patients not understanding the implications of a VND, reduced sensitivity

Patients who are uncooperative

Patients who are agitated

© Redsense Medical 2014 • www.redsensemedical.com
Patients with fistulas located other than cephalica or brachea, e.g. locations which are not visible easily submitted to friction

Patient with known small blood leakage oozing around venous needle

Patients with diabetes and frequent hypoglycemic episodes during HD therapy

All patients dialyzing without or with limited supervision e.g.

Sleeping
Nocturnal
Self care / Low care
Home
Isolation rooms in clinics, ICU

Minimizing the risk of VND requires a combination of human skills, vigilance and technology

Patient and staff awareness is important

Hemodialysis machines failing to detect VND

VP alarm failed to detect VND until significant blood loss

Pressure drop caused by a cannula slipping such event is usually too small to be detectable by the venous pressure monitor

VP measure is an unreliable method for detecting needle dislodgement

Incidence and severity of incidents of VND

1/126 718 treatments, a catastrophic hemorrhage with 33% mortality = 136 deaths / year (=2/week)
1/62 500 serious bleeding (include cath & needles = 2/day)

5% has a needle come out (=200/day)

6.1% VND incidents (review of all type of incidents 562 over 1 year)

0.1% VND incidence rate

1/500 000 death

3% of treatments bleeding leading to corrective action (0.9% complete VND)

Post VND higher mortality risk due to infections

VND incidents are underreported

VND remains the most common cause of preventable death in dialysis and is a serious risk for the home patient.

414 episodes of fatal VND episodes are likely an underestimate

Without doubt VND is the most unexpected and potentially life-threatening complication in dialysis.

Cost related to VND

VND Costly complication

Minor VND 522–1183$/blood transfusion

Sever VND 4 days hospital/blood/EPO/Plasma expanders.... 114 000$ and up

Liability costs

Cost of blood transfusion 522–1183$/transfusion

Minimization of undetected VND

Minimization of undetected VND episodes can be aided by blood loss detection devices use.

Blood Transfusion complications

Cost of blood transfusion 522–1183$/transfusion

Blood transfusion related to 16% higher long term mortality

© Redsense Medical 2014 • www.redsensemedical.com
Incident Reporting

Only Hospital-operated facilities must report events under the Act 13 of the Medical Care Availability and Reduction of error Act of 2002 (freestanding dialysis clinics are excluded)

Pennsylvania Safety Advisory

Electrical Safety

Further a direct electronic sensor such as a moisture or enuresis detector is not suitable since research have shown that a DC 5 V power supply could cause a micro shock by ionization in the skin.

Akihiro T et al

Literature list

Review includes the following publications:

11. Hurst, J, Keep an Eye On Your Needle, Kidney Times #312
16. Patients Safety Advisory; Veteran Health Administration Warning System; Published by VA Central Office; October 21, 2008
17. Patient Safety Alert, Health Administration Warning System; Published by VA Central Office; July 6, 2010
20. Derik White, Gambro; Oral presentation EDTNA Congress Florence 2007 (Oral presentation)
21. T. Court: Physicist engineer (PhD) Gambro R&D — France, Dr M. Chawki Néphrologist Ermont – Cormeilles en Parisis (95) France 2008


28. News coverage NBC, Diagnosing–dialysis an investigative report


34. Olsson P. Sundström M. Annotated Pro Publica Articles (25, 29–33)


40. Dr. Martin E. Lascano, Michael Bradley Andersen RN, Cleveland Clinics; Venous Needle Dislodgement Prevention in Hospital Based Hemodialysis. Abstract ASN November 2011


© Redsense Medical 2014 • www.redsensemedical.com