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Online-HDF: The superior quality of treatment

Thomas Ryzlewicz

Via Medis Dialysis Center, Germany

The author is doing online-HDF since 21 years with the Set-Up of today. According to the papers of Canaud (2007, Kidney International, retrospective) as well the new papers (both 2013, Blankenstijn (from the Netherlands) and Maduell (from Spain), both prospective, is proven longer life is possible for patients, when they are treated with online-HDF. When online-HDF is done in a poor Medical Quality (= low convective Volume for Fluid Exchange, let's say 15 Ltrs. per treatment), than you never have this effect of longer living (> papers of Poland and Turkey, good monitors, good Dialyzers but poor Medical Quality). online-HDF was developed by Stanley Shaldon in Montpellier. With other words: When you perform online-HDF in a correct way, than you will have the benefit. If you perform this only in a poor quality, than this is "only expensive" without a benefit. So sufficient treatment time as well as a convective Volume of 22 Ltrs. / treatment are important. Several problems connecting with this theme are: The way of disinfection: Whenever disinfection with hot-citric acid is allowed today (with empty Fluid Lines), there is CFU growth, as the two ultrafilters of the monitor are completely filled with water. By this weak disinfection you will reduce the quality of water to the AMI Standard (= 102 CFU/ml) instead of the required SAL 6 (= Sterility Assurance Level of 10⁻⁶, reduction of 8 potencies). To reach the necessary state of the constructive SAL 6, you need Peracid-Acid (low Percentage) and regular bacteriologic sampling. The placement of the infusion fluid: Unfortunately nearly all of them had chosen the lower efficient post-dilution, as this is easier to understand. But reality is even simple: With the same convective exchange of liters you have the higher Kt/V with the pre-dilution. Physicians, Nephrologist only see in pre-dilution the reduction of the concentration gradient. But they don't see the big secondary protein membrane (by the high TMP) as well as not the longer way for diffusion for small molecules, as from the middle to the end of the dialyzer you have a severe packed cell volume (with black color of the Blood instead of red). The industry has completed to go the wrong way (> post-dilution in pressure driven mode auto-processing). Pre-dilution is the end continues with the higher Kt/V. Additional you have here the chance to enlarge the Liter-Exchange from 6 Liter/hour to 9 liter/hour with simple volume mode (> here dialysis flow to 600 ml/min.). This never can be done with post-dilution. The diameter of the single fiber capillaries: Hemo & MPO studies have clearly shown, that there is no benefit, when using a Highflux in comparison to a lowflux. But when there is no benefit of Highflux-HD, the use of it is Standard today. In order to enlarge to back-filtration, the UF-coefficients had grown up. But in conclusion the convective volume is by far today low with highflux-HD and not comparable with a full driven online-HDF. To reach this target the systemic pressure (= blood pressure entry at the dialyzer) can reach one entire atmosphere (750 mm Hg). This is provoked by the too small diameters of the single fiber capillaries of the majority or the dialyzers of today. 750 mm Hg should not be appear in a Medical System. The author's target is to recommend online-HDF only, when it's done in perfect quality (as this is the production of infusion fluid, sufficient time of treatment and volume exchange 22 liters as minimum). But when this can't be reached, than it would be better, not to allow online-HDF by the FDA in the USA.

Biography

Thomas Ryzlewicz is a Nephrologist since 40 years with regular clinical work with RRT patients. In 1974 he used several of the first Dialysis Set-Up's (Travenol 120 Batch System, Milton Roy B II, Gambro AK 3) and in 1978 Bag-Hemofiltration was done (with the Equipment of 3 Blood Pumps, one Bed Scale and a Cup to measure the Filtration Rate (with a Stop-Watch).

thomas.ryzlewicz@web.de

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