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**The ultrafiltration coefficient of a dialyser is not a fixed value, and it follows a parabolic function: the new concept of KUF max: is this true?**

Sir,

We read with much interest the article from Ficheux *et al.* [1] that appeared in advance access in *Nephrology Dialysis and Transplantation* on 8 September 2010. The paper describes a parabolic relationship between ultrafiltration coefficient (KUF) and ultrafiltration rate (QUF).

The falling KUF with increasing QUF is due to blood protein boundary effects (protein cake effect) and increased resistance to ultrafiltration and is well described in the literature [2].

Our group measured precisely this effect a decade ago in clinical studies using haemodiafiltration (HDF) [3] and showed that the continuous intravenous infusion of hypertonic glucose was able to reduce the decay of KUF [4]. The regulatory authorities recognize this variability of KUF and require its measurement at low QUF to avoid these boundary effects.

The rising KUF with increasing QUF (<60 mL/min) has not been shown in previous studies and is probably an artefact. In order to calculate KUF accurately, values for transmembrane pressure (TMP) and QUF are required. The study did not use an accurate method for measuring TMP. Three pressure transducers were used, whereas four transducers are required for accuracy [5]. TMP is not corrected for oncotic pressure as is required. The study assumed that the actual QUF delivered was the same as set on the machine. The ultrafiltration pump may lose accuracy under increasing load and this could explain the apparently rising KUF.

It is recommended that variations in KUF should be taken into account by the HDF monitor to optimize the treatment. Newer HDF systems such as those designed for mixed HDF already use the technology. They provide real-time continuous measurement of QUF and KUF. TMP is measured using four sensors and corrections are made for effective blood flow, total protein and haematocrit. This information is used to optimize the ultrafiltration rate by adjusting post- and pre-dilutional flow [5].

In conclusion, the only original finding of the paper, that KUF increases with increasing ultrafiltration rate up to 60 mL/min, may be incorrect and requires confirmation by more accurate measurement.

*Conflict of interest statement.* None declared.

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**Transmembrane pressure, ultrafiltration coefficient and the optimal infusion rate in haemodiafiltration**

Sir,

In their work published in *NDT* in advance access, 8 September 2010 [1], Ficheux *et al.*, based on a parabolic relationship between dialyser ultrafiltration coefficient KUF and ultrafiltration rate QUF (KUF = QUF/TMP; TMP = transmembrane pressure), proposed the concept of KUF max, the highest QUF/TMP ratio (vertex of the parabola), as an index to optimize QUF during post-dilution HDF.

The relationship resulted from an experimental setting, unusual in clinical HDF practice, in which very low QUF (20–60 mL/min) were applied in the first part of the session. Here, back-filtration may have affected KUF calculation, as also admitted by the authors. Indeed, an increase in KUF during HDF sessions has never been reported in the literature. Instead, all previous studies demonstrated that KUF rapidly deteriorates just after the start of a HDF session due to the progressive thickening of the secondary membrane protein layer [2,3].

Our experience, based on several hundred HDF sessions with different infusion modes and high-flux dialysers monitored online with four pressure transducers [3,4], showed that the highest *in vivo* KUF always takes place through the intact membrane at the very early start of the session, during which KUF decreases slowly but progressively. This trend is shown in Figure 1, as a mean of the pooled post-dilution HDF session of our studies [3,4].