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Kaisa Liukko

Effect of decay correction on perfusion estimates - study with real [^{15}O]H_2O PET data

One PET image from a skeletal muscle perfusion study was examined to find out differences between perfusion estimates from dynamic and static images. The scanning had been performed as dynamic and then the image was reconstructed both as dynamic and static. In order to receive a static image the frames of the sinogram were summed before reconstruction.
The same measured blood curve was used as input for both images when autoradiography analysis was performed.

Table 1 shows that for regions of high perfusion, the bias between dynamic and static data is much less than for low perfusion regions. Regions where perfusion is between 15-40 ml/(min*100ml) have in average 6.6% bias, whereas regions with perfusion between 1-6 ml/(min*100ml) have in average 51.4% bias (dynamic data as baseline).
For the high perfusion regions the correction methods correct the bias almost completely, whereas for low flow regions the bias after correction is still 47.6 % in average.

	Perfusion dynamic img	Perfusion static img	Difference /dyn perfusion	Perfusion static img	Difference /dyn perfusion
Region				(correction)	
RQF	3.30	1.70	49 %	1.82	45 %
RIM	3.02	1.06	65 %	1.14	62 %
RRF	4.71	2.80	41 %	3.01	36 %
RVL	1.10	0.28	74 %	0.30	72 %
RVM	5.92	4.27	28 %	4.58	23 %
LVL	21.32	19.68	8 %	20.87	2 %
LVM	16.45	15.29	7 %	16.25	1 %
LIM	29.88	27.52	8 %	28.84	3 %
LQF	25.89	24.20	7 %	25.49	2 %
LRF	36.41	35.36	3 %	37.19	-2 %

Table 1. Columns 2, 3 and 5 represent the perfusion estimates for different regions of interest, first estimated from dynamic image, then from static image without any corrections and last from static image with corrections. Columns 4 and 6 represent the percent differences of the perfusion estimates received from dynamic and static images [100*(dynamic perfusion-static perfusion)/dynamic perfusion].