麻广宇,邵明哲,陈英茂,徐白萱,田嘉禾,陈云爽,孙雪峰.计数时间窗位置对SPECT测定肾小球滤过率的影响[J].中国医学影像技术,2013,29(6):967~971

计数时间窗位置对SPECT测定肾小球滤过率的影响

Influence of counting time window position on SPECT determination of glomerular filtration rate

投稿时间： 2013-01-29 最后修改时间： 2013-05-12

DOI：

中文关键词：双血浆法 体层摄影术,发射型计算机,单光子 肾小球滤过率 放射性核素显像

英文关键词:Dual plasma sample method Tomography, emission-computed, single-photon Glomerular filtration rate Radionuclide imaging

基金项目:科技部国际科技合作项目(2009DFA32960)。

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中文摘要:

目的 观察计数时间窗位置对SPECT测定肾小球滤过率(GFR)的影响。 方法 以231名北京地区健康居民为研究对象,分别采用双血浆法和^{99m}Tc-DTPA肾动态显像法测定GFR(GFR_{dt}和GFR_{Gates})。在以血流灌注相峰值点时间(峰时)为新时间原点的时间-计数率曲线上依次移动时间窗,于25个时间点上提取计数,并分别计算各点上的GFR_{Gates}。分析不同药物累积相峰时GFR_{Gates}与GFR_{dt}的相关性。 结果 ①左右肾脏血流灌注相峰时均值分别为(19.69±5.20)s和(20.29±5.19)s,基本呈正态分布。②肾滤过累积相峰时均值为(166.19±50.22)s,呈偏态分布,频数峰为132 s。③时间窗位于累积相峰值区时GFR_{Gates}达到最大,在峰值两侧,GFR_{Gates}均减小。④时间窗位于累积相峰值左侧上升区时,GFR_{Gates}与GFR_{dt}的相关系数随时间窗后移而增加;当后移到时间窗内含有部分峰值区段时,相关系数增速变缓;随着时间窗与峰值区段的重叠增加,相关系数达拐点,随后开始减小。 结论 在以肾血流灌注相峰时为原点的时间-计数率曲线上,提取86~145 s时间窗计数,可获得受时间影响较小的GFR。

英文摘要:

Objective To explore the influence of counting time window position on SPECT determination of glomerular filtration rate (GFR). **Methods** A total of 231 health residents of Beijing area were enrolled. Dual plasma sample method and ^{99m}Tc-DTPA dynamic renal imaging were used to determining GFR (GFR_{dt} and GFR_{Gates}). The time window was moved in turn at time-count rate curve which taking blood perfusion phase peak as the new time origin, and 25 counts were extracted from 25 time points, then GFR_{Gates} was calculated, respectively. Among various cumulative phase peak time, the correlation between GFR_{Gates} and GFR_{dt} was analyzed. **Results** ① At left and right renal blood perfusion phase peak time, the mean value was (19.69±5.20)s and (20.29±5.19)s, respectively, all were nearly normal distribution. ② At renal filtration accumulation phase peak time, the mean value was (166.19±50.22)s, showing skewed distribution, and the frequency peak was 132 s. ③ GFR_{Gates} was the maximum when the time window positioned on the cumulative phase peak area. On both sides of the peak value, GFR_{Gates} decreased. ④ When time window in the accumulation phase peak raise on the left area, the correlation coefficient between GFR_{Gates} and GFR_{dt} increased with time window after the shift. When time window moved to some position that containing some peak section, the correlation coefficient was slowing. With the increase of time window and peak overlapping segments, the correlation coefficient reached inflection point, then began to decrease. **Conclusion** When 86-145 s time window counts are extracted from the time-count rate curve that taking blood perfusion phase peak as the time origin, GFR can be obtained with smaller influence of time.

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