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Krypton-81m Imaging of the Right Ventricle

TO THE EDITOR: We would like to make a mild protest, both to the authors and referees concerning "Krypton-81m of the Right Ventricle" by Horn et al. (*J Nucl Med* 26:33-36, 1985).

Two full papers were published on this subject in 1980 (*1*) and 1983 (*2*) and not referred to by the authors. The last article used an almost identical method to the one outlined on a larger number of normal subjects and patients (55 subjects compared to 15 normals and an unspecified number of abnormals) with an almost identical result being quoted for the normal range of ejection fraction of the right ventricle. It appears misleading to "report the development of a method" which has been explored by others.

Having made our protest, however, we agree with the point made that krypton-81m i.v. infusion is an excellent tracer for studying the right heart which could profitably be explored by other groups. Krypton-81m infusion, both intravenously and intra-arterially is a valuable and under utilized way of achieving excellent function images of regional flow which will reflect changes induced by physiologic alterations and interventions (*3*). It has been applied to regional pulmonary blood flow (*3*), regional cerebral blood flow (*4*), the myocardial blood flow (*5,6*) and has even been applied to skeletal blood flow (*7*). With the increasing use of krypton as an agent for ventilation in the USA, we would hope to see a greater use of these applications of the tracer as an indicator of regional perfusion.

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Krypton-81 Imaging of the Right Ventricle

TO THE EDITOR: We read with interest the paper by Horn et al. published in the *Journal of Nuclear Medicine*, Vol. 26, January (*1*). Having routinely used the krypton-81m (^{81m}Kr) for the right ventricular study the last few years (*2*), we agree that the steady-state ^{81m}Kr method is actually the best available approach for evaluating the right ventricular (RV) ejection fraction. This conclusion is undoubtedly also shared by other authors who have also been involved with this technique for many years (*3,4*).

There is, however, one methodological aspect of the Horn's paper which we feel needs further discussion. The calculation of the ejection fraction without background correction is only valid if the background activity is negligible. This is, however, not the case in the steady-state ^{81m}Kr right ventricular study as the lung activity included in the right ventricular regions of interest (ROIs) is quite important.

As stated by the authors, the activity in the lung during continuous infusion of ^{81m}Kr correlates closely with the technetium-99m (^{99m}Tc) macroaggregated albumin lung perfusion image. Therefore, by using the ^{99m}Tc lung perfusion image performed in exactly the same position as the ECG gated study, the ^{81m}Kr activity in the lung included in the RV ROIs can easily be calculated (*2*). In a series of 50 patients, we evaluated the importance of this activity and the results showed that the ratio of lung activity included in the RV ROI over the total activity in this region varied from 20 to 60% depending on the state of the lung perfusion in this area and also on the right ventricular ejection fraction. It is evident that a background activity of this magnitude can hardly be neglected as it will introduce an important, systematic, but variable underestimation of the calculated ejection fraction.

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