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Lectura recomendada

Effect of ^{99}Tc on the radiochemical purity of $^{99\text{m}}\text{Tc}$ radiopharmaceuticals

Waight, Lynn A.; Cunnane, Caroline M.; O'Brien, Lesley M.; Millar, Alistair M.

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Abstract

Objective: The longer the time between elutions of a technetium-99m ($^{99\text{m}}\text{Tc}$) generator, the greater the $^{99}\text{Tc} : ^{99\text{m}}\text{Tc}$ ratio in the eluate. Information is limited on how this affects the radiochemical purity (RCP) of $^{99\text{m}}\text{Tc}$ radiopharmaceuticals. The aim was to determine whether the RCPs of $^{99\text{m}}\text{Tc}$ radiopharmaceuticals are affected when prepared using $^{99\text{m}}\text{Tc}$ -pertechnetate from a generator that remained uneluted for 7 days.

Methods: Eight $^{99\text{m}}\text{Tc}$ radiopharmaceuticals were investigated: albumin nanocolloid, macralb, medronate, mertiatide, pentetate, sestamibi, succimer and tetrofosmin. Five samples of each were prepared with eluate from a generator that had been previously eluted within 24 h (control). These were compared with five samples adulterated with ^{99}Tc to replicate the $^{99}\text{Tc} : ^{99\text{m}}\text{Tc}$ ratio present in eluate from a generator that has remained uneluted for 7 days (test). The RCP of each sample was measured 1 h after preparation and at the product's expiry.

Results: Significant differences ($P < 0.05$) were found between the RCPs of control and test samples of albumin nanocolloid, mertiatide and sestamibi 1 h after preparation. In each, the test sample had lower RCP, but was satisfactory. Similar results were found for macralb with added ^{99}Tc , but the RCPs of the test samples were unsatisfactory at $83.9 \pm 4.2\%$. The RCPs of all control and test samples were satisfactory at expiry.

Conclusion: Seven of the eight radiopharmaceuticals tested can safely be prepared using eluate from a generator that has remained uneluted for 7 days. Under these conditions, care must be taken when preparing $^{99\text{m}}\text{Tc}$ -macralb, as its RCP remains unsatisfactory up to 2 h after preparation.



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