

DURATION OF RADIOACTIVITY IN THE MILK OF A

NURSING MOTHER FOLLOWING ^{99m}Tc ADMINISTRATION

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In view of the fact that iodide is concentrated by the salivary glands, gastric mucosa, and breast milk (1-3) as well as by the thyroid gland, Spencer et al recently studied the breast secretion of another anion of the seventh group of the periodic table, the pertechnetate ion, in women with the amenorrhea-galactorrhea syndrome (4). In the two patients studied, the pertechnetate ion in the form of ^{99m}TcO₄⁻ was concentrated in the breast secretion although less so than that reported for radioiodide. In view of this finding, the administration of ^{99m}TcO₄⁻ to the postpartum nursing mother would carry the risk of transferring radioactivity to the suckling child. We recently had the opportunity of studying a nursing mother in whom the possibility of a brain tumor was strongly suggested. This offered a unique opportunity to determine how long after the administration of ^{99m}Tc it would be necessary to discontinue breast feeding.

CASE REPORT AND METHODS

A 24-year-old married white female developed seizures during an otherwise uneventful pregnancy. Five weeks after delivery of a normal baby, a brain scan was carried out following the intravenous administration of 10 mCi of ^{99m}Tc-sodium pertechnetate. Since she was nursing at the time of the brain scan, milk was extracted from the breasts by a breast pump for 4 days following the administration of the sodium pertechnetate. The total amount of milk obtained each morning at 8:00 am was brought into the laboratory where the amount of radioactivity was immediately determined.

TABLE 1. AMOUNT OF RADIOACTIVITY PRESENT IN MILK OF NURSING MOTHER AFTER INTRAVENOUS ADMINISTRATION OF 10 mCi ^{99m}Tc

Time post ^{99m} Tc (hr)	Volume of milk (cc)	μCi ^{99m} Tc/cc	Total activity ^{99m} Tc (μCi)
22	59	0.11	6.5
46	59	0.003	0.177
70	40	0	0
94	18	0	0

RESULTS

The amount of radioactivity obtained in each sample analyzed is shown in Table 1. There was a significant amount of radioactivity in the milk 22 hr after the administration of the radioactive pertechnetate. Because of the short half-life of ^{99m}Tc, very little radioactivity was found in the sample obtained 46 hr after the brain scan. No radioactivity was detectable at 70 and 94 hr.

In view of these findings, it is evident, that the administration of large amounts of ^{99m}TcO₄⁻ for scanning can be carried out in the breast-feeding woman. However, there is significant radioactivity in the milk for at least 24 hr after administration and small amounts remain at 46 hr. By the third day, there was no radioactivity detected in the milk in this patient. It is suggested, therefore, that, if scanning techniques using ^{99m}TcO₄⁻ are required in the nursing mother, a breast pump be used for at least 3 days after the administration of the isotope. This clinical setting offers a unique opportunity to study the effects of probable inhibitors (perchlorate, thiocyanate) of the concentrating mechanism of the breast for such anions. These studies could be carried out in the nursing mother without exposing the baby to excess radiation.

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