Studi biodistribusi dan dosimetri internal 99mTc-Red blood cells produksi in house pada organ jantung, hati, ginjal, dan kandung kemih kelinci = Biodistribution and internal dosimetry of 99mTc-Red blood cells produced in house in rabbit's heart, liver, kidney and bladder study

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Abstrak

Studi biodistribusi radiofarmaka 99mTc-Red Blood Cells merupakan parameter kualitas produk kit radiofarmaka dan berguna sebagai tinjauan dosimetri radiasi internal. Injeksi 99mTc-RBC dilakukan melalui intravena telinga kelinci dan dilanjutkan dengan scanning PA dinamik dan statik selama 80 menit. Biodistribusi menunjukkan nilai tangkapan radiofarmaka tertinggi terdapat pada jantung (100%) pada periode 10-15 menit, diikuti dengan organ hati (81.93%), ginjal kanan (70.92%), dan ginjal kiri (45.51%). Organ dengan waktu eliminasi obat paling cepat dibuktikan dengan nilai konstanta laju eliminasi (k) terbesar, yakni terdapat pada organ jantung (1.94 x 10-2/menit), sedangkan nilai terkecil pada organ ginjal kiri (5.0 x 10-3/menit). Perhitungan dosimetri internal menghasilkan nilai 6.517 x 10-4 mGy/mCi pada jantung, 6.259 x 10-4 mGy/mCi pada ginjal, 1.677 x 10-4 mGy/mCi pada hati, dan 2.244 x 10-3 mGy/mCi pada kandung kemih. Implementasi perhitungan laju eliminasi diwujudkan dalam bentuk kalkulator evaluasi laju eliminasi organ pasien.

.....The study of biodistribution and dosimetry testing for 99mTc-Red Blood Cells has been done to assess the quality of product and predict internal patient’s dose. Tc-99m RBC were injected at intravenous of rabbits and periodically scanned with PA planar imaging for several interval times up to 80 minutes after 99mTc-RBC injected. Biodistribution shows the highest activity percentage in the heart (100.0%) at period 10 - 15 minutes, followed by liver (81.93%), right kidney (70.92%), and the left kidney (45.51%). Organ with the most rapid drug elimination is evidenced by the largest elimination rate’s value (k) which is present in the heart (1.94 x 10-2 /minutes), while the smallest is left kidney (5.0 x 10-3 /minutes). Internal dose calculation shows 6.517 x 10-4 mGy/mCi for heart, 6.259 x 10-4 mGy/mCi for kidney, 1.677 x 10-4 mGy/mCi for liver, and 2.244 x 10-3 mGy/mCi for bladder. Implementation of the elimination rate calculations realized in the form of organ elimination rate calculator to patient evaluation.