

Red Cell Mass Measurement Using Technetium ^{99m}Tc to Differentiate Absolute Erythrocytosis (Polycythemia) from Relative Erythrocytosis

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Objective: The aim of this study is to show that measurement of red cell mass is essential to differentiate absolute erythrocytosis from relative (spurious) erythrocytosis.

Setting: Nuclear Center, Baghdad Teaching Hospital, Iraq.

Design: Prospective study.

Method: This study was performed in September 2002. Seven patients with packed cell volume over 51 were included in the study. Amerscan Stannous agent was injected intravenously followed by the collection of 10ml of blood at 15 minutes. 2 MBq (50uCi) of freshly generated ^{99m}Tc in 0.2ml of saline was added to the collected blood. A standard sample was retained for control. The suspension of ^{99m}Tc was injected intravenously and blood sample was collected at 10, 20 and 30 minutes.

Radioactivity was measured using a scintillation counter. Red cell mass was calculated and then factored into an equation which included body weight, height and surface area.

Result: Three out of seven (42.85%) had increased red cell mass which indicates that PCV alone is not an accurate indication of true erythrocytosis. Patient's weight ranged from 52-90kg, the mean is 77.47kg and the surface area ranged 1.52-2.10 the mean is 1.90. Therefore, considering the surface area in the measurement of red cell mass is recommended.

Conclusion: PCV alone is not accurate indication of true erythrocytosis. Surface area should be considered with the measurement.

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Measurement of red cell mass (RCM) and its relationship to that expected for an individual's height and weight permits initial subdivision of erythrocytosis into absolute increased RCM or apparent normal RCM^{1,2}.

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