

Whole Body Potassium Counter (WBKC)

By Sunderarajan Padmanabhan

New Delhi, April 09: A state of art whole body potassium counter to accurately estimate the body cell mass (lean body mass) has been built at St John's Research Institute (SJRI), with funds from the Department of Biotechnology. Total body potassium (TBK) determined by using whole body counting of naturally occurring radio-active potassium (^{40}K), gives an accurate measure of the total body potassium and from this body cell mass (BCM) or the metabolically active tissues of the body can be measured.

This method is considered to be the “gold” standard for measuring BCM. These measurements do not require the administration of radioactive substances but simply *count the background (or naturally occurring) radioactivity* within the body. Therefore, this method has the added advantage of being safe, non-invasive and cost effective.

The TBK method was the reference method used by the World Health Organisation (WHO) in defining protein requirements during pregnancy. However, these experiments were performed only in the USA, owing to the expense of the equipment. This facility which was **NOT** available anywhere in India and is now available at SJRI. The WBKC has been used to accurately estimate the protein requirements of Indian pregnant women and the results have been published in the American Journal of Clinical Nutrition.

Precise and accurate quantification of BCM will allow the assessment of nutritional status at all stages of life, from loss of vital tissue with age or during disease (cancer, renal conditions) to growth studies in infants and children. The WBKC is currently being used to for core research purposes and for addressing several public health nutrition issues facing the nation today. Accurate estimates of body composition and BCM in infants from birth to 6 months of age is being measured as a part of a multi-centric study funded by the International Atomic Energy Agency (IAEA). The effect of early stunting on body cell mass and fat mass in term appropriate for gestational age (AGA) infants is being investigated in a DBT funded project. Other future areas of research include the measurement of BCM in children with Acute Lymphoblastic Leukemia (ALL) undergoing chemotherapy.



Publications

1. Naqvi S, Bhat KG, Preston T, Devi S, Joseph J, Sachdev HS, Kurpad AV, Kuriyan R. The development of a whole-body potassium counter for the measurement of body cell mass in adult humans. *Asia Pac J Clin Nutr.* 2018; 27:1190-1197.
2. Kuriyan R, Naqvi S, Bhat KG, Thomas T, Thomas A, George S, Nagarajarao SC, Sachdev HS, Preston T, Kurpad AV. Estimation of protein requirements in Indian pregnant women using a whole-body potassium counter. *Am J Clin Nutr.* 2019 Apr 1;109(4):1064-1070. doi: 10.1093/ajcn/nqz011.

Contact: Dr.Rebecca Kuriyan Raj, St.Johns Research Institute, Bangalore, "Dr.Rebecca Kuriyan Raj" <rebecca@sjri.res.in>;