# NUCLEAR MEDICINE RESEARCH DIVISION

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The Nuclear Medicine Research Division is actively involved in conducting research studies on non-communicable diseases.

## RESEARCH PROJECTS

## 1. NON-COMMUNICABLE DISEASES

### 1.1 NUTRITION

#### 1.1.1 Development of equation for prediction of total body water by using deuterium dilution method and bioelectrical impedance analysis (BIA) among children

Body composition assessment is useful procedure for the study of nutritional status and water distribution in children. This study was aimed to develop the equation for prediction of total body water by using deuterium dilution method and bioelectrical impedance analysis (BIA) among children. A total of 104 children (58 boys, 46 girls) aged between (4 - 7) years participated in this study. Mean of body weight, height and body mass index (BMI) were (15.84 $\pm$ 2.23) kg, (107.23 $\pm$ 6.65) cm and (13.73 $\pm$ 0.94) kg/m$^2$ respectively. The percentage of fat mass and fat free mass were calculated from total body water (TBW) which was measured by deuterium oxide dilution method using the Fourier Transform Infrared Spectrometry (FTIR). Mean fat mass and fat free mass were (13.24 $\pm$ 1.96) kg and (2.60 $\pm$ 0.84) kg respectively. Bioelectrical impedance was measured by using BIM 4G, Bioimpedance meter. The correlation coefficient between resistance index (Height in cm$^2$/ resistance) obtained from BIA and total body water obtained from deuterium dilution method was analyzed in order to develop the equation for prediction of total body water (TBW) among children. Regression coefficient of weight and resistance index were 0.5651(P<0.0001), 0.0473 (P=0753). R$^2$-adjusted and multiple correlation coefficients were 0.8708 and 0.9345 respectively. TBW= 0.5651*W+ 0.0473* Ht$^2$/R + 0.5680(P<0.0001) equation was obtained. The results of the present study showed the measurement of bioelectrical impedance could be used as the reliable and valid predictor for calculation of total body water (TBW) in children. This equation can be used in 4 - 7 years age children only, not other age group. Therefore, to assess TBW in term of body composition different age groups of child population need to be studied for validity of bioelectrical impedance.

#### 1.1.2 Assessment of nutritional status through body composition measurement by deuterium dilution technique in children living in areas targeted agricultural interventions for food security (Body composition measurement aspect)

This study is a collaborative research with Nutrition Research Division. Agricultural interventions can directly affect food and nutrition security by alterations in the production of

nutrient-dense foods and/or income derived through agricultural livelihoods. The study aimed to assess the nutritional status of two to five years old children living in *Kyar Hone, Kyein Pike, Yaes*o, *Thanpayarkhone* and *Lamutangyi Village*, *Htan Ta Pin* Township, Yangon Region. Agricultural interventions have been carried out by Welth Hunger Hilfe (International Non-Governmental Organizations of Food Security Working Group) in intervention villages (*Kyar Hone, Kyein Pike, Yaeso*). The third and fourth time surveys were conducted during January, 2016 and August, 2016. A total of 118 children aged between 2 - 5 years (58 children from families receiving agricultural interventions and 60 children from farmer- headed families living in *Thanpayarkhone* and *Lamutangyi* villages) participated in the study. The percentage of fat mass and fat free mass were calculated from total body water (TBW) which was measured by deuterium oxide dilution method using the Fourier Transform Infrared Spectrometry (FTIR). In comparison of fat free mass and fat mass between and third and fourth data collection, increased fat free mass and decreased fat mass were found in both intervention and non- intervention group. However, changes of fat free mass in intervention group and non-intervention group were (1kg vs. 1.4 kg) and those of fat mass were (0.29 kg vs. 0.2 kg). Therefore, the effect of agriculture intervention on changes of body composition in the study children was not significantly different.

## SERVICES PROVIDED

ACADEMIC

| Sr. | Name | Course | Responsibility |
|-----|------|--------|----------------|
| 1. | Daw Yin Yin Win | 1st year, MMedSc (Physiology) UM (1), UM (2), DSMA 1st year, MMedSc (Biochemistry) DSMA | Teaching Demonstration |
| 2. | Daw Aye Aye Maw | 1st year, MMedSc (Physiology) UM (1), UM (2), DSMA 1st year, MMedSc (Biochemistry) DSMA | Teaching Demonstration |