

Estimating brown adipose tissue activity for a study of hot flashes

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This presentation compares methods of estimating brown adipose tissue (BAT). As part of an ongoing study of BAT activity in relation to hot flashes, we asked women aged 45-55 to place their hand in cool (17°C) water. We took a thermal image of each woman (Flir camera) before and after the cooling of her hand. To estimate BAT activity, we compared the change in temperature in the supraclavicular area with a control area. Initially, we used a point on the mid-sternum as the control. Because we were concerned that there may be BAT tissue along the sternum, we also tried a control region on the mid-right arm. We used two equations to estimate BAT activity. The first computed the difference in maximum supraclavicular temperature (SCT) minus the difference in the control temperature [(PostMaxSupraclavicular – PreMaxSupraclavicular) - (PostControlMean - PreControlMean)]. Mean BAT estimated from the maximum SCT and arm temperature was higher (0.80, s.d. 0.51, range 0 to 2.10) than from the maximum SCT and sternal temperature (0.63, s.d. 0.45, range 0 to 1.70). There was no relationship between biceps skinfold and arm temperature, or between other anthropometric measures (summed skinfolds, BMI, percent body fat) and estimates of BAT. The sample size is, to date, too small to draw conclusions (n=36), but as the reported severity of hot flashes increased (“none,” “a little,” “somewhat,” “a lot”) the mean BAT estimated with the sternal control also increased (0.49, 0.65, 0.68, 0.74). This was not true when the arm was used as the control.

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