Effects of calorie restriction on age-related derangements in penile neurovascular structure in the rat

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BACKGROUND
- The reduction in smooth muscle content, impaired growth factor and cytokine signaling have been demonstrated in the penis in age-related ED
  Hannan JL, J Sex Med 2010

- CR refers to a reduction in calorie intake without compromising essential nutrients to avoid malnutrition
  Yu BP Aging Methods and Protocols 2000

- Rapid diet-induced weight loss in obese male has been shown at least 10% reduced of inflammation, and improvement in endothelial function in obese male
  Esposito K, JAMA 2004

PURPOSE
To determine whether CR diet can reverse the age-related alterations of erectile tissue in the aging rat
Animal: male fischer 344 rats, young adult (7 months) and old (22 months) rats were used for diet modification study. Obtained from Aging Tissue Bank (http://knrrb.knrrc.or.kr; Busan national university, Busan, Korea).

Testosterone level, immunofluorescence staining
- G1: young adult rats + ad-libitum diet
- G2: old rats + ad libitum diet
- G3: young adult rats + calorie restriction diet
- G4: old rats + calorie restriction diet
Erectile function declines in aged rats

Values are mean ± SE for n=6 animals per group. * P<0.05
CR diet increases serum testosterone level in old rats

CR

Values are mean ± SE for n=4 animals per group. * P<0.05
CR decreases cavernous endothelial cells apoptosis

Values are mean ± SE for n=5 animals per group. * P<0.05
CR increases smooth muscle and endothelial expression

Values are mean ± SE for n=5 animals per group. * P<0.05
CR increases pericyte content in aged rats

Values are mean ± SE for n=5 animals per group. * P<0.05
CR increases nerve cell contents

Values are mean ± SE for n=5 animals per group. * P<0.05
CR reverse age related collagen deposition

Values are mean ± SE for n=4 animals per group. * P<0.05
CONCLUSIONS

• CR successfully improved age-related derangements in penile neurovascular structures and hormonal disturbance. Along with a variety of life style modifications, our study gave us a scientific rationale for CR as a non-pharmaceutical strategy for treating or preventing ED in aged men.
Thank you for your attention