

# Nutrition in Stroke: Acute Care

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# Risk Factors: Obesity

- ▶ Obesity → BMI  $\geq 30$  kg/m<sup>2</sup>
  - ▶ Overweight → BMI 25-29 kg/m<sup>2</sup>
- ▶ According to WHO, >700 million (9.6%) were obese by 2015 worldwide
- ▶ Overweight/obesity significantly a/w increased risk of stroke
  - ▶ For every unit increase of BMI above normal → 6% increase in the adjusted relative risk of stroke
  - ▶ Similar for men and women, regardless of race
- ▶ Obesity → increased risk of HTN and T2DM
- ▶ Central adiposity better predictor of stroke risk
  - ▶ Waist/hip ratio
  - ▶ Risk higher for middle-aged pts vs older pts

# Risk Factors: Obesity

## Intermediate Variables

- ▶ Hyperlipidemia/Dyslipidemia
  - ▶ TG >150 mg/dL
  - ▶ LDL >100 mg/dL
  - ▶ HDL <40 for men, <50 for women
  - ▶ Total cholesterol >200 mg/dL
- ▶ Afib
  - ▶ Unclear if Afib causes atherosclerosis or vice versa
- ▶ OSA
  - ▶ Oxidative stress, inflammation, endothelial dysfunction
- ▶ HTN
  - ▶ Stage I: 140-159/90-99 mmHg
  - ▶ Stage II:  $\geq$ 160/100 mmHg

# Risk Factors: Obesity

## Intermediate Variables

### ▶ T2DM

- ▶ HbA1c  $\geq 6.5$
- ▶ FBG  $\geq 126$  mg/dL
- ▶ OGTT  $\geq 200$  mg/dL
- ▶ Central adiposity  $\rightarrow$  hormone dysregulation  $\rightarrow$  insulin resistance over time
  - ▶ Increased inflammatory cytokines TNF $\alpha$ , iNOS, MCP-1, and IL-6; decreased adiponectin release
- ▶ Obesity increases risk of HLD, HTN, T2DM, Afib, OSA which increase risk of stroke
  - ▶ Damage to vasculature from inflammation, advanced glycation end products contributing to atherosclerosis/likelihood of blockage and/or thrombosis
  - ▶ Hypercoagulability, enhanced platelet aggregation

# Obesity Etiology:

- ▶ Combination of genetic/environmental factors
  - ▶ Psychology, intake vs energy expenditure, gut microbiome, social environment, food availability, food and nutrition-related knowledge
  - ▶ Studies have found >50 genes a/w obesity including melanocortin 4 receptor, LEP, LEPR, INSIG2, ADIPOQ
  - ▶ Genes control hormonal interactions b/t insulin, leptin, ghrelin

# Risk Factors: Obesity

- ▶ Though stroke risk increased → prognosis may be better in overweight/obese vs normal wt counterparts
  - ▶ “Obesity paradox” - decreased mortality rates in event of stroke
  - ▶ May also be r/t age, with younger obese pts at higher mortality risk vs older obese pts
  - ▶ May decrease risk of hemorrhagic transformation s/p stroke, stroke recurrence, improved functional recovery
  - ▶ OSA a/w higher risk of mortality/poor outcome
- ▶ May be r/t obese survivors healthier at baseline vs those with metabolically “benign” obesity
  - ▶ 11-25% of obese people have normal BG and insulin regulation

# Prevention: Weight Loss

- ▶ Wt reduction → may improve BP, BG, TG and HDL levels; insulin sensitivity; inflammatory marker
  - ▶ Proportional to amount of wt lost
- ▶ 5% to 10% wt loss:
  - ▶ HbA1c → decrease 0.5%
  - ▶ SBP → decrease 3-6 mmHg
  - ▶ HDL → increase 3 mg/dL
- ▶ 6% wt loss among overweight persons w/ impaired glucose metabolism
  - ▶ 58% reduction in progression to DM
- ▶ >10% wt loss:
  - ▶ HbA1c → decrease 1.4%
  - ▶ 42% to 51% improvement in insulin resistance
  - ▶ TG → 30-70% decrease
  - ▶ HDL → 10% to 19% increase
- ▶ Diet-based programs including intensive/frequent lifestyle counseling → most successful

# Nutrition Specifics in Stroke:

## ▶ Ischemic stroke:

- ▶ Dysphagia present in 78% of pts
- ▶ Lack of hypermetabolism present
  - ▶ Kcal needs not significantly increased
  - ▶ Increased risk of aspiration PNA
- ▶ May be on altered consistency diet, per SLP recs
  - ▶ Solids:
    - ▶ Purees → mechanical ground → dental soft
  - ▶ Liquids:
    - ▶ Honey-thick → nectar-thick → thin

## ▶ Hemorrhagic stroke:

- ▶ ICH, IVH, IPH, SDH, SAH, EDH, hematoma
- ▶ ~126-139% above normal energy needs based on HBE
- ▶ Traumatic PRO needs are higher if TBI also present



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