NCD Risk Factors in Rarotongan Adolescents

Siobhan Tu'akoi

University of Auckland

Supervisors: Karen Tairea, Mark Vickers, Jacquie Bay, Neti Herman

Summer Studentship

- 10 Week Project

- Study constructed by CIMoH and the Liggins Institute

- Approved for pre-feasibility by CIMoH

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Situation in the Cook Islands

- NCDs cause 80.5% of all deaths (CIMOH, 2015)

- Premature NCD deaths (<70yrs)

    -Female: 52.5%

    -Male: 61%

- Hypertension: 33%

- Raised cholesterol: 75%

- Cardiovascular Disease:

    -180 deaths/100,000 females

    -350 deaths/100,000 males

- Diabetes: 24% (20-79yrs), 46.6% est. undiagnosed (WHO, 2008)

Risks & Maternal Health

- 91.1% adult (25-64yrs) overweight and a rise of obesity from 61.4% in 2004 to 72.2% in 2015(CIMOH, 2016).

- Rates of overweight children have risen 1.7 fold from 2003 to 2015 (CIMOH, 2015).

- 68% obesity in reproductive-age females (STEPS, 2011).

    -smoking, nutrition, BMI, GDM

    -increases risk of pregnancy complications→ offspring
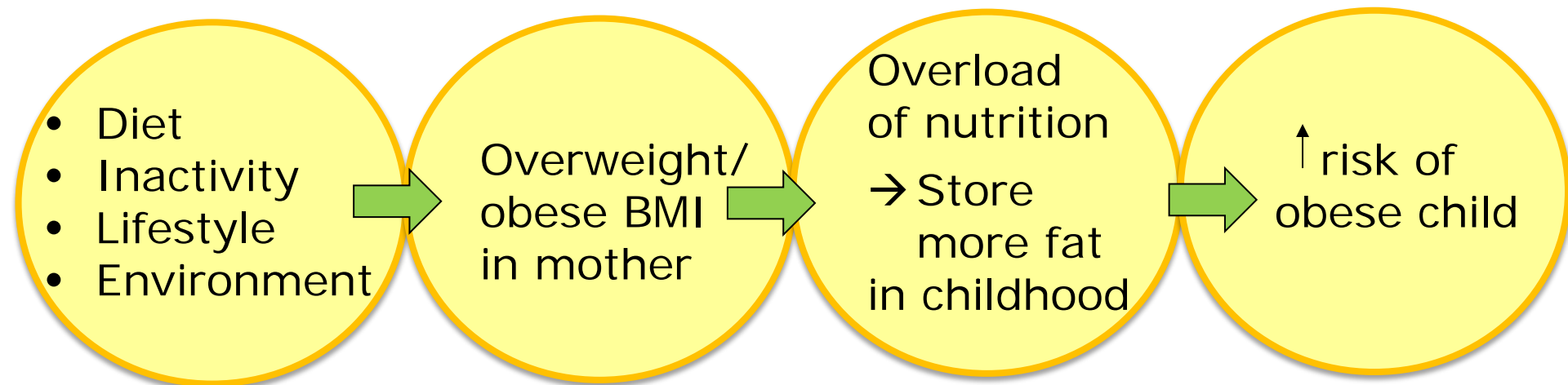
DOHAD

- Impact of the early-life environment on later health

- Poor early life environments can alter development in offspring → linking to later obesity and disease

- Associations between various birth factors and increased risk of obesity in adolescence

- Healthy start to life can reduce future NCD risk & promote good early development

What happens in the womb lasts a lifetime

International Studies

- Large cohort studies show relationships between birth factors, and the likelihood of future disease in offspring.

- Liggins Study: Overweight Swedish mothers were 3x as likely, and obese mothers were 5x as likely, to have a daughter that would later become obese (Derraik et al., 2016)·

- Diet
- Inactivity
- Lifestyle
- Environment

→ Overweight/ obese BMI in mother

→ Overload of nutrition → Store more fat in childhood

→ ↑risk of obese child

Pre-Feasibility Study

- Similar trends in the Cook Islands? Is it relevant?

- <u>Aim:</u> Whether existing CIMoH data could be examined to potentially inform life-course based NCD risk interventions

- Investigating relationships between birth factors and adolescent health measurements.

Methods: Data Collection

- CIMoH biennial school physical health examinations for 75 high school students in Rarotonga i.e. BMI, BP

- Matched with birth data from obstetric registers from Rarotonga hospital that listed the following factors:

-Mother's age	-Antenatal risk factors
-Parity	-Birth weight
-Gestation	-Blood loss
-Head Circumference	-Mode of Delivery
-Chest Circumference	-Length

Results: BMI & Birth Factors

Factor	No.	Normal BMI	Overweight/Obese BMI	RR
Antenatal Risk F.				
• Yes	19	5 (26%)	14 (74%)	1.34
• No	49	22 (45%)	27 (55%)	
Birth Order				
• First-Born	17	5 (29%)	12 (71%)	1.25
• Not First-Born	51	22 (43%)	29 (57%)	
Birth Weight				
• High/Low BW	14	6 (43%)	8 (57%)	0.93
• Normal BW	54	21 (39%)	33 (61%)	

Adolescent BP & Birth Factors

Factor	No.	Normal BP	(Pre)Hypertension	RR
Antenatal Risk F.				
• Yes	12	6 (50%)	6 (50%)	1.28
• No	33	20 (61%)	13 (39%)	
Birth Order				
• First-Born	9	6 (67%)	3 (33%)	0.75
• Not First-Born	36	20 (56%)	16 (44%)	
Birth Weight				
• High/Low BW	10	6 (60%)	4 (40%)	0.93
• Normal BW	35	20 (57%)	15 (43%)	

International Comparisons

Parity

- First borns linked to higher BMIs. Suggested that lower BW in first borns, rapid post-natal weight gain

  → increased BMI later (Ayyavo et al 2013; Derraik et al., 2015; Siervo et al., 2010)

Birth Weight

- Low/High BW (outside 2.5- 4kg range) linked to higher BMIs and blood pressure in adolescence

Antenatal Risk Factors

- Gestational hypertension, previous LSCS→ higher probability of developing obesity

Implications

- Indicates relationships between birth factors and adolescent health

- Contributes to evidence → focus NCD prevention at improving maternal health and the early-life environment

- Inform future research/interventions

Where To From Here?

Limitations: Sample (size, age range), limited parental info

- BHSc Honours project (cross-sectional study)

- Aim: To examine links between adolescent health data from a Year 9 cohort and their birth factors

- Sample of 170 students, more parental information, current health measurements i.e. waist circumference

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