Abstract

Three studies were designed to explore: (i) cultural determinants of optimal breastfeeding practices among Indigenous Mam-Mayan women in the Western Highlands of Guatemala, (ii) the relationship between subclinical mastitis and impaired infant anthropometric indicators and (iii) the role of infection, inflammation, hygiene and lactation practices in underscoring the complex relationship between subclinical mastitis and infant growth.

Manuscript 1 explored whether cultural influences were associated with achievement of the World Health Organization infant feeding recommendations and if these cultural practices served as moderators of the relationship between breastfeeding practices and infant weight-for-age (WAZ). Mothers who delivered at the traditional midwife’s house and those that did not believe in the transmission of susto (fright) through breast milk were more likely to initiate breastfeeding within 1 hour postpartum. Higher breastfeeding frequency was observed among mothers who spent more time in the temascal (sauna). Initiating breastfeeding within 1 hour postpartum was the sole infant feeding practice positively associated with exclusive breastfeeding and infant WAZ. This work highlighted that health practitioners need to understand how local cultural practices influence early initiation of breastfeeding to promote adequate infant weight.

Manuscript 2 compared mothers with SCM (breast milk Na/K ratio >0.6) and without SCM for selected factors and practices and evaluated if SCM increased the likelihood of infant stunting (LAZ<-2SD), underweight (WAZ<-2SD) and microcephaly (HCZ<-2SD) in a cross sectional study. Older maternal age, higher parity, higher breastfeeding frequency, and increased hours of maternal daily walking characterized mothers with SCM. In a multiple logistic regression, the presence of maternal stool Entamoeba coli increased the odds of infant microcephaly. Importantly, SCM increased the likelihood of infant stunting, underweight and microcephaly. Given the demonstrated associations between SCM and anthropometric indicators of poor infant growth, improving maternal breast health may be required to improve infant growth.

Manuscript 3 explored the prevalence and determinants of SCM at 0-6 wks (early) and 4-6 mo (established) in a longitudinal cohort of mothers and investigated the contribution of infection, inflammation,
mammary gland permeability, and growth factors present in milk to infant WAZ, LAZ, and HCZ at both stages of lactation. Prevalence of SCM (Na/K ratio >0.6) differed between early and established stages of lactation demonstrating that SCM did not persist. Determinants of SCM at 0-6 wks were lack of home faucet and parity and at 4-6 mo were lack of home faucet, lower feeding frequency, and higher early milk Na/K ratio. In early lactation, increased mammary gland permeability and maternal stool *B. hominis* impaired anthropometric measurements WAZ and HCZ whereas leukocytes in urine and the pro-inflammatory cytokine IL-6 in milk were associated with increased LAZ and HCZ, respectively. In established lactation, maternal stool *E. coli* impaired WAZ and LAZ, milk EGF was negatively associated with LAZ and HCZ whereas milk pro-inflammatory cytokines TNF-α and IL-6 were associated with increased WAZ and HCZ. This study suggests that breast milk is a pathway through which non-genetic transmission of growth faltering is passed although an inflammatory response in the mammary gland may provide a measure of protection to the infant.

Taken together, these studies re-enforce the promotion of optimal breastfeeding practices among Indigenous Mam-Mayan mothers and endorse cultural practices during lactation but caution health practitioners not to underestimate subclinical mastitis and the importance of breast milk as a vehicle for transmission of poor growth.

**CURRICULUM VITAE**

**UNIVERSITY EDUCATION**

2011- present  
**Doctor of Philosophy (PhD)**  
School of Dietetics and Human Nutrition  
McGill University

2007-2009  
**Masters of Public Health (MPH)**  
Department of Health Sciences,  
Lakehead University

2002-2006  
**Honors Bachelor of Health Science (BHSc)**  
Minor in Religious Studies  
School of Health Studies  
The University of Western Ontario

**SELECTED PEER REVIEWED PUBLICATIONS**


**SELECTED PUBLISHED CONFERENCE ABSTRACTS**


**SELECTED HONORS AND AWARDS**

2016 American Society of Nutrition (ASN): Clinical Emerging Leader Award Oral Competition
2016 The International Society for Research in Human Milk and Lactation (ISRHLML) Trainee Award. Funded in part by Bill & Melinda Gates Foundation.
2015 Institute of Parasitology/Centre for Host and Parasite Interactions Bridge Funds, McGill University
2015 Graduate Excellence Award in Dietetics and Human Nutrition
2014 Catherine Freeman Fellowship in Human Nutrition
2014 Christine Gagnon Memorial Scholarship
2013 Graduate Excellence Award in Dietetics and Human Nutrition
2013 Catherine Freeman Fellowship in Human Nutrition
2013 Graduate Research Mobility Travel Award
2012 Graduate Excellence Award in Dietetics and Human Nutrition
2012 Graduate Research Enhancement and Travel Award
2011 Catherine Freeman Fellowship in Human Nutrition
2011 McGill University Graduate Excellence Award
2011 McGill University Graduate Travel Award
2010 McGill University Provost Graduate Entrance Scholarship

**CURRENT PROFESSIONAL AFFILIATIONS**

- International Society for Research in Human Milk and Lactation (ISRHLML)
- Canadian Society for International Health (CSIH)
- American Society of Nutrition (ASN)
- Canadian Public Health Association (CPHA)

**SELECTED EMPLOYMENT**

2009 – 2010 Public Health Planner Communicable Disease, Dental & Sexuality Resources Department Region of Waterloo Public Health (ROWPH); Information Program and Planning Team Waterloo, ON

2008 - 2010 Research Assistant Department of Social, Prevention & Health Policy Centre for Addiction and Mental Health (CAMH) Social & Community Prevention Research Toronto, ON

2006- 2008 Medical Record Coordinator MEDCAN Health Management Inc. Toronto, ON

**SELECTED VOLUNTEER EXPERIENCE**

2016 Syrian Refugee Sponsorship Group Guelph, Ontario

2014 Social Equity & Diversity Education Office: Calendar Project McGill University, Montreal

2003 World University Service of Canada (WUSC): Canada World Youth Costa Rica

**LANGUAGE SKILLS**

- Spanish (basic oral)
- French (basic oral)
- American Sign Language (intermediate)