

Assessment of Factors Associated with Neural Tube Defects During COVID19 Pandemic: Results from Multi-Neonatal Intensive Care Units in Northern Jordan

August 17th 2022/ Dr. Marah Hailat – JNIL research fellow

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SCIENTIFIC BACKGROUND AND SIGNIFICANCE OF THE PROBLEM

- **Neural tube defects (NTDs)** are a group of birth defects which result from incomplete closure of the neural tube during the early stages of embryonic development [1].
- Worldwide, over 300,000 babies are born with NTDs annually [2]. However, the prevalence of the condition in low-income countries is not clear [3]. In Jordan, *Prior to COVID-19 the prevalence of NTDS was 1.4 per1000 births [4].*
- Inadequate levels of folate (vitamin B9) and vitamin B12 during pregnancy have been linked to having an increased risk of NTDs [5]. Folic acid supplementation and fortification decreased the frequency of NTDs by ~ 70%. Nevertheless, 30% of cases are not folate-dependent and are due to other causes [6].
- *One of the attributable risks for NTDs is BMI \geq 29 [7].* During COVID-19 lockdown, **68.5% of Jordanian females became obese** [8]. Thus, the risk for NTDs is expected to increase. Moreover, *antenatal care visits dropped by 38.6% globally*, along with a decline in prenatal visits as well [9,10]. Hence, NTDs prevention and screening is expected to decrease.

POLICY RELEVANCE

- The Jordanian government introduced a fortification program for wheat flour with iron and folic acid in 2002 and implemented folic acid supplementation in antenatal care centers in 2004 [11,12].
- However, while I was doing my rotation as an intern doctor in the Neonatal Intensive Care Unit (NICU) during the pandemic, I've noticed high numbers of NTDs admissions. Therefore, screening and identifying variables associated with NTDs occurrence is important to modify this situation. Obtaining results will help the government reconsider all programs and services provided for pregnant mothers. Consequently, this will help in decreasing the burden of disabilities and/or the fetal and neonatal mortality rates.



Aims and objectives

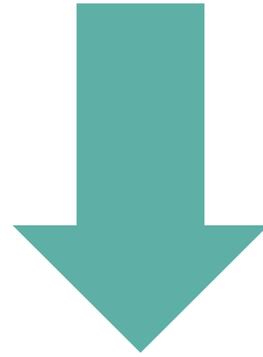
To investigate the effects of the COVID-19 pandemic on the prevalence of NTDs

To study different factors associated with higher risk of NTDs.

To identify the most significant factors attributable to increasing the risk of NTDs



Research Question/Hypothesis



Did COVID-19 pandemic increase the risk of NTDs due to declined antenatal care visits and/or weight gain during lockdown?

STUDY DESIGN AND TARGET POPULATION

- A **cross-sectional** epidemiological study (survey) will be conducted on a sample of babies who were born with Neural Tube Defects in 12 different hospitals in Northern Jordan during the COVID19 pandemic period between **December.2020 and August.2022**.
- Data collection will start after the proposed research is approved by the Jordanian Ministry of Health (JMOH), Jordanian Royal Medical Services (JRMS) and King Abdullah University Hospital (KAUH) Institutional Review Boards (IRB)
- Babies born before the pandemic or without history of Neural Tube Defects will be **excluded** from the study.
- Data will be collected through multiple visits to **Neonatal Intensive Care Units** with the aim of reviewing past **medical records** and the records of new cases in the unit. Through those visits contact information of participants will be gathered to fill the study **questionnaire** with their parents.

STUDY DESIGN AND TARGET POPULATION

- All parents that approve to participate in the research will be asked to sign a **consent form** before filling the questionnaire.
- The questionnaire that will be used will be reviewed by a panel of neonatologist and nutrition specialists to ensure validity and a pilot study of 15 participants will be conducted to ensure reliability before creating its final form.
- The questionnaire will consist of questions regarding **sociodemographic, medical, antenatal, and nutritional aspects.**

SAMPLING

- All babies born with Neural Tube Defects between December.2020 and August.2022 in the 12 selected public hospitals located in northern Jordan will be included in this study.
- Based on the study published in 2010 by M AL-Qudah, et.al which reported that the **prevalence of Neural Tube Defects was (1.4/1000 births)** [4] and based on the **number of live births in 2020** reported by the Jordanian Department of statistics which was 54,565 births [13], the estimated number of cases is expected to be around 76 babies ($1.4 \times 54,565 \div 1000 \cong 76$).

Data management and statistical analyses

- Collected data will be coded and entered into a Microsoft Excel spreadsheet (Microsoft Corp., USA) and analysis will be performed using **SPSS** statistical package (IBM SPSS Corp., USA) version 25.0 software for Windows.

➤ **CONFLICT OF INTEREST STATEMENT**

There is no conflict of interest.

➤ **How does this research contribute to the overall JNIL research agenda on maternal, infant, and young child nutrition in Jordan?**

Hopefully, the findings of this study will help in decreasing the burden of disabilities and/or the fetal and neonatal mortality rates associated with NTDs.

➤ **Acknowledgment**

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