

# Geographical Determinants of the Prevalence of Gestational Diabetes in North and South Kivu in the Democratic Republic of Congo

**Rogatien Mwandjalulu Kisindja<sup>1\*</sup>, Pierrot Lundimu Tugirimana<sup>1, 2</sup>, Mitangala Ndeba Prudence<sup>3</sup>, Katenga Bosunga<sup>4</sup>, Jean-Jeannot Juakali Sihalikyolo<sup>4</sup>, Prosper Kalenga Muenze Kayamba<sup>5</sup> † and Albert Mwembo Tambwe-A-Nkoy<sup>5</sup>**

<sup>1</sup>Catholic University La Sapiientia (UCS)/Goma, department of gyneco-obstetrics

<sup>2</sup>University of Goma (UNIGOM), Department of Internal Medicine

<sup>3</sup>Department of Epidemiology and Medical Statistics of Official University of Ruwenzori (UOR)

<sup>4</sup>Department of Gyneco-Obstetrics of the University of Kisangani (UNIKIS)

<sup>5</sup>Departments of Gyneco-Obstetrics and public health of the University of Lubumbashi (UNILU)

**\*Corresponding author :** Rogatien Mwandjalulu Kisindja, Catholic University La Sapiientia (UCS)/Goma, department of gyneco-obstetrics, Catholic University La Sapiientia. Tel: +243991590351. E-mail: mkroga@gmail.com

## ABSTRACT

**Objectives:** To explore the geographic determinants of gestational diabetes in eastern DRC and to seek confounding factors.

**Methods:** Cross-sectional descriptive study with a multicenter analytical aim conducted in the hot and cold season from April 2019 to February 2021.

Included were 392 pregnant women at 24-28 weeks of amenorrhea. Blood glucose, cortisol, SO<sub>2</sub>, anthropometric measurements, 30 previous day's temperature, altitude and atmospheric pressure (atm) were examined. The glycaemia  $\geq 92$ mg/dL was pathological, in which case cortisolaemia was measured after matching with normal glycaemia.

Data were analyzed using SPSS version 23 by calculating median, proportion, ANOVA, Pearson's Chi<sup>2</sup> or Fisher's exact test, Wilcoxon -Mann-Whitney test.

**Results:** The proportion of 23.8%, 37.4%, 13.8% and 25.0% of 392 pregnant women lived respectively at the altitude of 1400 m, 1500m, 1700m and 2419m. Pathological glycaemia was twice higher at  $< 1700$  m = atm  $> 82\%$  [32.9% (n = 295)] Vs  $\geq 1700$  m [15.0% (n = 295)] [OR 2.2 95% CI (1.5- 3.2)] (p<0.001)] and at SO<sub>2</sub>  $> 95\%$  [30.8% (n= 331)] Vs SO<sub>2</sub>  $\leq 95\%$  [15.3% (n= 144)] [OR 2.0 95% CI (1.3 - 3.1)] (p < 0.001). Cases with pathological glycaemia had elevated cortisol [281.1 nmol/L (87.6)] (n=118) Vs normal glycaemia [261.1 nmol/L (71.1)] (n= 156)] (p= 0.024).

**Conclusion:** The prevalence of pathological glycaemia was higher at  $< 1700$  m altitude corresponding to the atm  $> 82\%$  and when the SO<sub>2</sub> was  $> 95\%$ . After adjustment, blood glucose was no longer correlated with temperature.

**Keywords:** Geographic Determinants, Gestational Diabetes, DRC