Maternal chorioamnionitis as a cause of perinatal death in the Child Health and Mortality Prevention Surveillance (CHAMPS) Site of Manhiça, Southern Mozambique.

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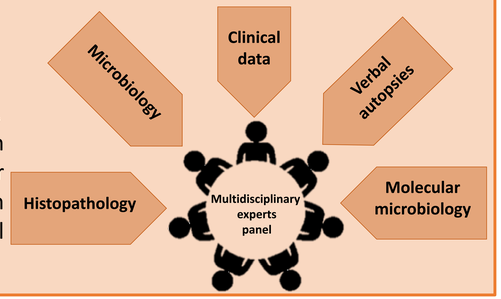
BACKGROUND

- ✓ **Chorioamnionitis** is a common complication of pregnancy, associated with maternal morbidity and perinatal deaths. However, its impact in low and middle-income countries (LMICs), such as Mozambique, is still poorly characterized.
- ✓ In LMICs, prenatal visits are still suboptimal, and preventive measures such as testing for *Streptococcus agalactiae* before delivery are not widely implemented.
- ✓ Perinatal healthcare assistance is far from guaranteed, thus potentially treatable delivery complications like chorioamnionitis have important consequences in both maternal and newborn's outcome.

THE STUDY

- ✓ **When?** December 2016 -February 2019
- ✓ **Where?** Manhiça district area - Southern **Mozambique,** Sub-Saharan Africa
- ✓ **What?** Child Health and Mortality Prevention Surveillance (**CHAMPS**) network, minimally invasive tissue sampling (**MITS**), were conducted post- mortem in order to ascertain the cause of death under five years of age and stillbirths, after written informed consent was obtained. Clinical data was collected from health facilities, and verbal autopsies were conducted with family members. The final diagnosis have been classified according to **ICD-10** coding system.



RESULTS

- ✓ A total of **171 MITS** were conducted in children under five years of age, including children less than 28 days of life and stillbirths. Almost **70%** of them (117) were **perinatal deaths**: 59 **Stillbirths (50%)**, 41 **Deaths in the first 24h (35%)** 17 **early neonatal deaths (1-6 days) (15%).**
- ✓ **Chorioamnionitis** was identified as a **main maternal condition leading to death in 17% of the perinatal death cases (20/117),** being the main death cause in **one in every 6 perinatal deaths**. This number might be higher, since the deliveries that occur at home usually don't have available placentas for their analysis.

N=20	Main maternal disease	Main condition in fetus or infant	Immediate cause of death in child (if identified)	Infectious agent (if iidentified)
Deaths in the first 24 hours N=9	Chorioamnionitis P02.7	Congenital Pneumonia P23	Bacterial Sepsis of newborn P36	*Streptococcus agalactiae*
		Intrauterine hipoxia P20		
		Congenital Pneumonia P23	Intrauterine hipoxia P20	
		Bacterial Sepsis of newborn P36	Bacterial Sepsis of newborn P36	*Fusobacterium nucleatus*
		Congenital Pneumonia P23	Bacterial Sepsis of newborn P36	*Escherichia coli*
		Bacterial Sepsis of newborn P36	Bacterial Sepsis of newborn P36	*Klebsiella pneumoniae*
		Congenital Pneumonia P23	Congenital Pneumonia P23	*Streptococcus spp*
		Bacterial Sepsis of newborn P36		*Streptococcus agalactiae*
		Congenital Pneumonia P23		
Early Neonates N=2		Bacterial Sepsis of newborn P36		*Pseudomonas aeuriginosa*
		Bacterial Sepsis of newborn P36		*Streptococcus agalactiae*
Stillbirths N=9		Congenital Pneumonia P23		*Streptococcus pneumoniae*
		Congenital Pneumonia P23		*Leptotrichia Amnionii*
		Congenital Pneumonia P23		*Streptococcus spp*
		Congenital Pneumonia P23		
		Intrauterine hipoxia P20	Low birth weight (2kgs)	
		Bacterial Sepsis of newborn P36		*Streptococcus spp*
		Intrauterine hipoxia P20		
		Intrauterine hipoxia P20		
		Bacterial Sepsis of newborn P36		*Streptococcus agalactiae*

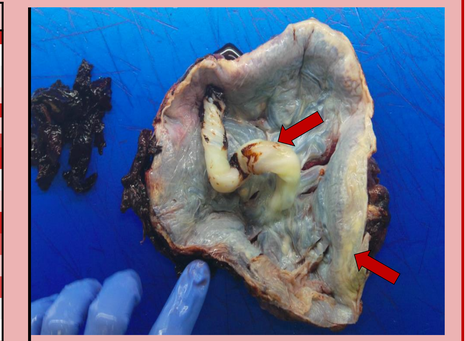
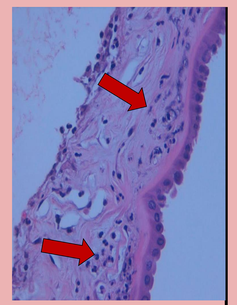
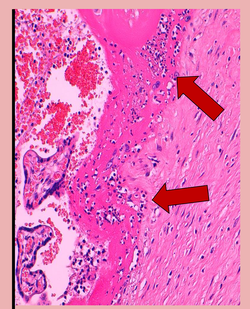


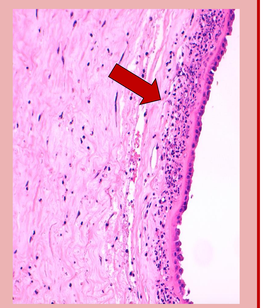
Image 1: Gross photograph of the fetal surface of fresh placenta after cutting membranes and part of the umbilical cord. The amnion/chorion and umbilical cord show greenish yellow discoloration, highly suggestive of chorioamnionitis and funisitis, respectively.

- ✓ A **microbiologial** agent was identified in **65% of the authopsies**. The remaining diagnosis were made with the **histopathological** study only. The **most frequent pathogens** isolated were the commonn neonatal infectious pathogens ***S. agalactiae*** and *E. Coli* (25% of the cases), followed by other *Streptococcus*. We also identified less frequent agents like *F. nucleatus*, *K. pneumoniae*, *P. aeuriginosa* and *L. amnionii*.



Images 2 and 3: Microphotographs of the umbilical cord of the placenta at 200x and 400x magnification. There is an extensive acute inflammatory infiltrate composed of neutrofils and images of endotheliitis, consistent with Fetal reaction to chorioamnionitis (funisitis with umbilical vasculitis).





Microphotographs of the fetal side of the placenta at 400x magnification. Amnion (**Image 4**) and chorion (**Image 5**) show extensive inflammatory neutrophilic infiltrate consistent with necrotizing chorioamnionitis.

- ✓ All the mothers had **antenatal visit records**. All the deliveries except one occurred in a **Hospital** facility. Only one of those has been attended by a **doctor**.
- ✓ None of the mothers presented **fever** during labour according to clincal data. None of them had done perinatal **screening** to *S. agalactiae*.

CONCLUSIONS

- ✓ **Chorioamnionitis** is an important factor in the chain of events leading to perinatal death in our setting.
- ✓ The most frequent pathogen isolated is ***S. agalactiae***, supporting the potential benefits of its screening and/or prevention.
- ✓ Our study confirms the significant impact of chorioamnionitis on **perinatal mortality**, and the importance of studying **placental samples** when available.