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Acute Infectious Meningitis in Pregnant Women at the University Hospital Complex Yalgado Ouédraogo Located In Ouagadougou in Burkina

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Introduction

The acute meningitis represents a diagnostic and therapeutic emergency from many etiologies which are more frequently from viral origin rather than from bacteria or mycosis. The meningitis from bacteria is serious and its medical costs covering must be fast and early in order to reduce the mortality and the neurological after-effects [1]. The pregnancy is combined with the increase of the seriousness of some catching illnesses such as meningitis. However very few publications deal with it [2-6]. The mortality from meningitis is high in the population in general and when one survives, it means that one must have some serious neurological after-effects. In the pregnant women, the acute meningitis puts the vital prognosis of the couple mother-child at stake, with a high risk of the fetal death or neonatal infections and post-delivery [2].

We face some cases of meningitis combined with pregnancy in epidemic time in Burkina. Hence, we found necessary to emphasize this study on them with a view to study the profile of some cases for a success in the prevention and medical costs covering of meningitis.

Methodology

It was about a cross-sectional study of the cases of acute meningitis in pregnant women who were hospitalized in the infectious disease department from January 1, 2010 through December 31, 2014. All the pregnant women whose ages were ranged from 15 years old to 45 years old, were the age of procreation, showed some suspicious symptoms from meningitis and whose spinal fluid was not sterile were taken into consideration in the review of records. All the pregnant women benefited from cyto-bacteriological and parasitological medical exams of the spinal fluid and the latex test (Pastorex meningitis kits), or culture allowed the germs identification. We concluded that deprived bacterial meningitis is any meningitis with some leucocytes in the spinal fluid and a past history of some antibiotics taking. The meningeal symptoms were missing or mild. The immediate microscopy and culture were often negative, but the diagnosis was done with the presence of leukocytes in the spinal fluid with a predominance of faded neutrophil poly-nuclear leucocytes [7]. The following variables were studied: the socio-demographic aspects of the cases (age, origin, living place, and profession), the clinical aspects (the medical and vaccinal antecedents, clinical symptoms, stage of pregnancy), etiological aspects (the identified germs) and the maternal and fetal prognoses. These data were gathered from the hospitalized patient's clinical records and tested by the software Epi info in its English version 3.5.1.

Results

From January 1, 2010 through December 2014 we listed in the department of infectious disease 108 (48.9%) female with the study's inclusions criteria. Among the cases, 50 of them (46.5%) were in the age of procreating and out of this number, 17 (34%) of them were pregnant.

Socio-demographic characteristics	Frequency (%)
Age (year)	
15-25	10 (59)
25-35	4 (23.5)
35-45	3 (17.5
Origin	
Ouagadougou	06 (35)
Other cities*	11 (65)
Residence	
Urban	11 (65)
Rural	6 (35)
Occupation	
House wife	15 (88)
Student	02 (12)
*Ziniaré=3 cases; Manga, Zorgo and Zabré=2 cases each; Kokologo and Sankoinsé=1 each case	

Table 1: Distribution cases by socio-demographic characteristics.

Socio-demographic characteristics of the cases

Women whose ages were ranged from 15 to 25 years old represented 59% of the study population. Most of the women 11 (65%) came from the other cities than Ouagadougou. Fifteen women (88%) were

married and 11 (65%) came from the urban environment. The fresh outbreaks times of meningitis cases were in March, April, July, August and December. The Socio-demographic characteristics of the cases are shown (Table 1).

Clinical and etiological characteristics of the cases

The recognized medical antecedents in the patients were the chronic otitis 3 cases (17.6%), HIV1 infection 2 cases (11.7%) and the head trauma 1 case (6%). Ten women (59%) were vaccinated against meningococcal A conjugate vaccine. Nine women (53%) were in the third quarter of their pregnancies. All the pregnant women had fever. We mentioned the meningeal stiffness in 15 cases (88%), convulsions in 10 cases (59%) and the coma in 13 cases (76.5%). Out of these 13 cases, 4 cases were at the stage I, 3 cases at the stage II, 5 cases at the stage III and 1 case at the stage IV). The spinal fluid look was cloudy in 13 (82%) cases. Latex examination/culture of spinal fluid was positive in 12 pregnant women and negative in 5 women; Out of the negatives cases of meningitis, 3 of them were lymphocytic meningitis and 2 were from deprived bacterial meningitis; these 2 cases of meningitis had a cloudy spinal fluid which contained more than 1,000 leukocytes with poly-nuclear neutrophils predominance.

Clinical aspects	Frequency (%)
Antecedents	
chronic otitis	03 (17.5)
HIV1 infection	02 (12)
Head trauma	01 (06)
No antecedents	11 (64.5)
Stage of pregnancy	
First trimester	02 (12)
Second trimester	06 (35)
Third trimester	09 (53)
Clinical signs	
Fever	17 (100)
Nuchal rigidity	15 (88)
Comatose	13 (76.5)
Connvulsion	10 (59)
Abdomino-pelvic pains	08 (47)
Headaches	07 (41)
Vomiting	03 (17.5)
Others*	02 (12)
*Premature rupture of membranes=1 case; bleeding=1 case	

Table 2: Distribution cases according to clinical aspects.

The identified germs were the *streptococcus pneumoniae* in 11 pregnant women (64.5%) and the *Neisseria meningitides* W in 1 pregnant woman (6%). The clinical and biologic characteristics are shown (Tables 2 and 3).

Biological aspects of cerebrospinal fluid N=17	Frequency (%)
Macroscopie	
Cloudy	14 (82)
Hematic	02 (12)
Clearly	01 (6)
Cytology	
Hyper leukocytosis with poly-nuclear neutrophils	14 (82.5)
Lymphocyte	03 (17.5)
Germs identification latex /culture	
Streptococcus pneumoniae	11 (64.5)
Neisseria meningitidis W	01 (6)
Negatif	05 (29.5)

Table 3:Distribution of cases according to the biological aspects of cerebrospinal fluid.

Progressive aspects in the pregnant women and their pregnancies

The pregnant women´s hospitalization duration was more than 7 days in 11 (65%) patients and the maternal lethality was about 40%. The fetal loss rate was marked by foetal deaths in the womb 6 cases (35%) and abortion 1 case (6%); which corresponds to a fetal lethality from 41%. Five women had a preterm birth (29.5%) and five other women (29.5%) had an ongoing pregnancy at the time of the study. The Table 4 shows the progressive aspects in the pregnant women and their pregnancies.

Discussion

The weaknesses of the study

The self–medication or past history of some antibiotic taking in the pregnant women before they are taken to the hospital probably transformed the culture of the spinal fluid into negative. The inadequacy of the technical equipment didn't also allow identifying some other etiologies of meningitis (viral, other bacteria) in the pregnant women. We discussed our results despite these inadequacies.

Among the women who were in the age of procreation and suffering from meningitis during the time of the study 34% of them were pregnant; this frequency was not negligible because any infection in a pregnant woman puts two lives at stake (the lives of the mother and child). The main germ was the pneumococcal with 11 cases out of 12 cases; indeed the immunological fragility of the pregnant women favored the bacterial infection such as the pneumococcal. Few studies were devoted to the combination of meningitis with pregnancy. We could quote the studies of Lucas from Nigeria in 1964 [2]. He took an interest in the *Pneumococcal meningitis* in the pregnant women and women who delivered: out of 31 women who were in the age of procreation and affected by *Pneumococcal meningitis*, 15 (48.38%) of them were pregnant. Lisa from the United States [3] also reported a case of *Pneumococcus meningitis*. The literature puts forward the

Streptococcus pneumoniae and *Listeria monocytogenes* as the two most frequent meningitis etiologies to try and find in the pregnant women [4-6].

Maternal-fetal outcome	Frequency (%)
Output modes pregnant (n=17)	
Death	6(35)
Healed	9 (53)
Transfert	1 (06)
Against medical advice Total	1 (06) 17 (100)
Maternal lethality (n=15)	6 (40 %)
Sequelae (n=15)	
Deafness	2 (13.5)
Hemiparesis Total	1 (6.5) 3 (20%)
Pregnancy outcome (n=17)	
Fetal death in the Womb	6 (35)
Preterm delivery	5 (29.5)
Current pregnancy	5 (29.5)
Abortion Total	1 (6) 17 (100)
Fetal lethality (n=17)	7 (41%)

Table 4: Distribution of cases by maternal-fetal development.

In France the listeriosis represents from 5% to 8% of the materno-fetal bacterial infections and the materno-neonatal forms represent from 20% to 25% of the cases [6]. Some other authors discovered in some pregnant women a listeriosis frequency of (43%) out of 782 cases which were listed in twenty countries [4]. The bacterium had a tropism for the central nervous system and Salamano demonstrated that this bacterium represented from 5% to 11% the etiologies of bacterial meningitis in the adult [5]. On the other hand, in our study the listeriosis was not discovered but should be actively diagnozed in pregnant women because the clinical outward symptoms are often limited to a flu pseudo syndrome which is most of the time mistaken for some other diseases. Some rare cases of *Hemophillus influenzae* meningitis were discovered in the pregnant women by some authors, whereas this germ is not commonly discovered in the adult [7]. The meningitis etiologies are numerous. But the inadequacy of the technical equipment for the viral meningitis diagnosis or mycobacteria meningitis makes most of the time that these etiologies are under diagnosed in our context of work: during the study there were 3 cases of meningitis with a predominance of lymphocytes and 2 cases of deprived bacterial meningitis which did spinal fluid culture was negative. Because the meningitis with meningococcal A is the main deadly epidemic every year, in 2010 Burkina Faso was the first country to vaccinate its population thanks to meningococcal A conjugate vaccine. This vaccination allowed to get rid of the meningococcal A in aid of some other germs such as pneumococcal [8]. The antecedents of chronic otitis, head trauma or HIV1 infection were discovered in the pregnant women. These factors of risk contributed to the appearance of pneumococcal meningitis in the pregnant women. The same factors of risk were discovered by Lucas and Lisa during their studies [2,3].

We noticed the great number of the cases during the cold period; the dusty wind and period of humidity represent some good conditions to favor the infections of the high respiratory tract and therefore represent the main canals for the pneumococcal. Yaka showed the role of the cold climate reinforced by the cold period in the appearance of the meningitis epidemics in Burkina [9].

During the study, the maternal lethality was about 40% and the fetal lethality was about 41%. The raised frequencies of the coma about 76.5%, convulsions about 59% and the fever in all the pregnant women, were the source of the important maternal and fetal mortality and premature births frequency noticed in the study. Some other authors also showed the seriousness of comatose forms and the mortality was superior to 50%. The mortality was 8 times more important than in the non-comatose forms. They also showed in their studies that the pneumococcal was responsible for lethality from 20% to 40% [10,11]. During our studies, some other factors were discovered in the pregnant women: stage of pregnancy (third quarter for more than one half of the pregnant women) and a living place which is far from Ouagadougou (for most of the pregnant women). These factors explained the heavy – maternal and fetal mortality mentioned in the study. More than one half of the pregnant women did not live in Ouagadougou and their living places are located from 31 miles to 62 miles to the University Hospital Complex Yalgado Ouédraogo and most of the time the roads are not in good conditions.

In the study, pneumococcal was the main germ that caused meningitis in the pregnant women; hence the conclusion of Lucas. According to that conclusion the pregnant women were predisposed to the Pneumococcus meningitis [2]. Because of the important maternal and fetal lethality mentioned in the study, it would be necessary to prevent this illness in the pregnant women through the vaccine against the pneumococcus which could be administered without any risk during the pregnancy [7].

Conclusion

The bacterial meningitis, such as the pneumococcal, was essentially the main cause of meningitis in the pregnant women. The other etiologies were probably under diagnozed and it is important to improve the technical equipment of the laboratory in the University Hospital Complex Yalgado Ouédraogo. The maternal and fetal lethality were important (about 40% for each one). The prevention of the pneumococcal meningitis through the vaccination against this germ had to be advised in the pregnant women.

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