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Original Research Article

Prognosis of umbilical cord prolapse: experiency of an African maternity

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ABSTRACT

Background: Assess the fetal prognosis of umbilical cord prolapse (UCP) at Cocody University Hospital.

Methods: It was a cross-sectional, descriptive and case-control study about 92 cases of umbilical cord prolapse beating. It took place over a period of 3 years from 1 January 2013 to 31 December 2015.

Results: The frequency of the umbilical cord prolapse beating was 0.73%. The patients came from other maternity in 84.8%. Upon arrival in our maternity, therapeutic attitude was dominated by the positioning of Trendelenburg (73.9%). The c-section was performed in 63% of cases. The fetal prognosis was bad; neonatal mortality was 41.3% at 5 minutes of life against 9.8% in the control group. The factors aggravating the fetal prognosis were the long delay between the occurrence of the umbilical cord prolapse and childbirth, the delivery mode and the small birth weight.

Conclusions: The late management and the evacuations negatively affect the fetal prognosis. Improving fetal prognosis requires quick care and the provision of an efficient technical platform surrounding maternity.

Keywords: Delivery mode, Fetal prognosis, Umbilical cord prolapse

INTRODUCTION

The umbilical cord prolapse (UCP) is an obstetrical accident occurring during labor. It causes a significant perinatal mortality. The quick realization of a c-section should permit to save the fetus. The umbilical cord prolapse is a rare obstetric situation (less than 1%); but very urgent with significant perinatal mortality of 36 345/1000 births.¹

This obstetrical accident is little studied in Côte d'Ivoire. It became necessary to carry out this study to assess the fetal prognosis of the umbilical cord prolapse beating in our maternity of Cocody University Hospital. It is a structure referenced which receives the obstetrical emergencies from surrounding hospitals.

METHODS

It was a cross-sectional, descriptive and case-control study over a period of three (3) years, from January 1st, 2013 to December 31st, 2015. Patients, considered as case of the study, were all cases of umbilical cord prolapse beating observed in the parturient with a gestational age greater than or equal to 28 weeks of amenorrhea of pregnancy singleton. 92 cases of prolapsed umbilical cord beating recruited. The control group was represented by parturient with a gestational age greater than or equal to 28 weeks of amenorrhea carrier of a singleton pregnancy and without umbilical cord prolapse. The controls were selected on the basis of a case for a control. So, for a umbilical cord prolapse identified case, the control was selected from a couple mother - child on the same day

with a mother of the same parity, the same age or near age (\pm a year). We have not been included in the study, the parturient with a gestational age less than 28 week of amenorrhea and all cases of umbilical cord prolapse not beating before childbirth. The data collected was entered and analysed using EPI INFO 6.0 software. The comparison of proportions was made by the test of the Chi² with a 5% significance level. Thus, tests giving a value of $P < 0.05$ were considered significant.

RESULTS

Frequency

During the study period, we recorded 12549 deliveries, 121 cases of umbilical cord prolapsed; 29 no beating on the admission and 92 beating. The average frequency of UCP beating was 0.73%. During the study period, we recorded 12549 deliveries, 121 cases of umbilical cord prociency, of which 29 were non-winged at admission and 92 cases. The average frequency of PCO flying was 0.73% (Table 1).

Table 1: Annual distribution of umbilical cord prolapse beating.

Years	Number of UCP	Number of delivery	Frequency (%)
2012	33	4115	0,80
2013	32	4268	0,75
2014	27	4166	0,65
Total	92	12549	0,73

Clinical data

Clinical data are presented in the Table 1. The parturient presenting an UCP were more often evacuated from surrounding maternity (84,8% cases) with an alteration of fetal heart rate in 41.3% of cases compared to the control group (7.6%).

The breaking of the waters had been spontaneous more often (78.3%). The fetus was in breech position in 34.8% of cases of UCP versus 7.6% in controls.

Table 2: Clinical examination data.

Clinical examination data	Case		Control		X ² et P	
	N (=92)	%	N (=92)	%		
Admission mode	Patient coming from house	14	15,2	46	50	X ² : 25.32 P : 0.000
	Evacuated from other maternity	78	84,8	46	50	
Fetal heart rate (FHR)	120 \leq FHR \leq 160 bpm	54	58,7	85	92,4	X ² : 28.27 P : 0.000
	FHR $<$ 120 ou $>$ 160 bpm	38	41,3	07	7,6	
Rupture of membrane	Spontaneous	80	87,0	41	44,6	X ² : 43.68 P : 0.000
	Artificial	12	13,0	51	55,4	
Fetal presentation type	Cephalic	55	59,8	83	90,2	X ² : 22.72 P : 0.000
	Breech	32	34,8	07	07,6	
	Transversal	05	05,4	02	02,2	
Cervical dilatation (cm)	$<$ 4 cm	19	20,6	21	22,8	X ² : 1.90 P : 0.386
	\geq 4 cm	54	58,7	59	64,2	
Degree of UCP	Complete	19	20,6	12	13,0	(ns)
	1 st degree	19	20,6			
	2 th degree	41	44,6			
	3 rd degree	32	34,8			

Table 3: Distribution of the pregnant according to the waiting treatment.

Waiting treatment	Case	
	N	%
Trendelenburg position	68	73,9
Repression of presentation	06	06,5
Humidification of the umbilical cord	02	02,2
other*	16	17,4

* Cases who received a Trendelenburg position, a repression of fetal presentation and a humidification of the umbilical cord.

Table 4: Distribution of the pregnant according to delivery mode.

Delivery mode	Case		Control	
	N	%	N	%
Caesarean-section	58	63,0	28	30,4
Vaginal delivery	34	37,0	64	69,6

X² = 22,69, ddl = 1, p = 0,000 (S).

Obstetric care

There are presented in Tables 3 and Table 4.

Delay diagnosis-delivery

The time period between diagnosis and childbirth was less than 2 h at 64.1% of cases compared with 42.4% in the controls.

Fetal prognosis

The fetal prognosis and the aggravating factors are listed in Tables 6 and 7. We noted 41.3% of neonatal deaths

against 9.8% in the controls; 17.4% of bad Apgar score against 4.3% in the controls.

The vaginal delivery has been harmful in case of an umbilical cord prolapse (p=0.000). The type of presentation did not influence the Apgar score in 5 minutes. The best Apgar scores at 5 minutes have been observed in children born within a period of less than 2 hours delivery. The low birth weight contributed to the neonatal death.

Table 5: Time period between diagnosis and delivery.

Time period (mn)	Case			Control	
	N	%		N	%
≤ 30	14	15,2	64,1	11	12,0
31-60	11	12,0		15	16,3
61-120	34	36,9		13	14,1
121-180	11	12,0		16	17,4
181-240	09	09,8		05	05,4
> 240	13	14,1		32	34,8
Total	92	100,0		92	100,0

X² = 20.45, ddl = 5, p = 0.000 (S), Minimal: 3 mn, Mean: 2h 24 mn, Maximum: 16h 47 mn.

Table 6: Distribution of newborns according to APGAR score at 1 minute and at 5 minutes.

State of newborn at birth		Case		Control		X ² et P
		N	%	N	%	
APGAR score at 1st minute	1-6	77	83,7	29	31,5	X ² : 51.27 p : 0.000
	≥7	15	16,3	63	68,5	
APGAR score at 5 minutes	0	38	41,3	09	09,8	X ² : 39.46 P : 0.000
	1-6	16	17,4	04	04,3	
	≥7	38	41,3	79	85,9	

Table 7: The prognostic factors.

Prognostic factors	APGAR Score at 5 minutes of live			
	0 (n= 38)	<7 (n=16)	>7 (n=38)	Total (n=92)
Delivery mode, X²=37.5, p=0.000 (s)				
Caesarean-section	10 (17,2%)	14 (24,1%)	34 (58,7%)	58 (63%)
Vaginal delivery	28 (82,3%)	2 (5,9%)	4 (11,8%)	34 (37%)
Fetal presentation type, X²=4.49, p=0.105 (ns)				
Cephalic	26 (47,3%)	6 (10,9%)	23 (41,8%)	55 (59,8%)
Other	12 (32,4%)	10 (27%)	15 (40,6%)	37 (39,2%)
Time between diagnosis and childbirth, X²=14.27, p=0.000 (s)				
<120 min	16 (27,1%)	14 (23,7%)	29 (49,2%)	59 (64,1%)
>120 min	22 (66,7%)	2 (6,1%)	9 (27,2%)	33 (35,9%)
Birth weight, X²=12.68, p=0.001 (s)				
<2500g	15 (71,5 %)	4 (19 %)	2 (9,5%)	21 (22,8%)
>2500g	23 (32,4%)	12 (16,9%)	36 (50,7%)	71 (77,2%)

DISCUSSION

The umbilical cord prolapsed is a rare obstetrical accident; less than 1% in our series (Table 1). In the

literature, the incidence of the prolapsed cord is low between 0.12% and 0.18%.²⁻³ Our high rate is due to selection bias, related to the recruitment mode (Table 2) with 84.8% patients were evacuated from surrounding

hospitals. This high rate of patients evacuated confirmed the reference nature of our structure, the Cocody University Hospital (UH-C). No patient (Table 3) received during the evacuation of the entire waiting treatment advocated in the literature if umbilical cord prolapse beating namely Trendelenburg positioning, the repression of fetal presentation by vaginal one-handed, the filling of the bladder by 500 to 750 cc of saline and the administration of (B-Mimetic).³ These gestures allow to minimize the fetal distress by promoting a decompression of the umbilical cord. The absence of these gestures can be related to neonatal mortality or a bad Apgar score at birth. We noted an acute fetal distress in 41.3% of cases compared to 7.6% in the controls. This

rate of 41.3% is higher than that of Traore (13.5%) but close to those of Alouini and Gannard-Pechin respectively 35.1% and 52.7%.²⁻⁴ The high rate is related to the character feticide the umbilical cord prolapse.

The umbilical cord prolapse beating was discovered in more than half of the cases (58.6%) more than 4 cm of cervical dilation. The diagnosis was made in 51% of cases to 7 cm of cervical dilation. The 2nd and 3rd degrees umbilical cord prolapse accounted for 79.3% of the cases. This rate is stackable to Traoré with 80.9% and other authors.²⁻⁵ In their studies, the prolapsed cord occurred during the 2nd phase of labor in case of spontaneous rupture or more often of artificial rupture of the membranes. The fetal extraction is based on two parameters: the fetal status at time of diagnosis and the imminence of childbirth. 20.7% of patients were at full dilation, they have given birth vaginally. But in total, in 37% of patients-cases, childbirth was done vaginally, aggravating the neonatal prognosis. Vaginal delivery has been practiced in the majority of cases because of the long delay before the realization of an emergency c-section. In the sub region, the sad fact is the same.⁴ Waiting for surgery, obstetric gestures realized were Trendelenburg positioning (73.9%), humidification of the cord by saline (2.2%) and the repression of the presentation by vaginal one-handed (6.5%).

The c-section was performed for 63% of cases compared to 30.4% in controls (Table 4). In most series of literature and had relatively high rates respective 84.2% and 66.7%.^{2,3} Caesarean section is the best route of fetal extraction suited in the case of umbilical cord prolapse beating to a better fetal prognosis.⁶ In industrialized countries, a c-section is possible in a very short time. In France, the delay is less than or equal to 15 minutes in case of extreme emergency.⁷ This has been possible by the implementation of the codes 'color' which reduces the decision-birth of emergency Caesareans.⁷ in our series we noted 41.3% of neonatal deaths against 9.8% in the controls. In European literature, mortality ranges from 3.9 to 9.1%.^{3,8,9} While in the Sub West African region, mortality remains high: in Nigeria, Kalu et al was a similar neonatal mortality 41.3%.¹⁰ Several factors contribute to worsen the fetal prognosis among which:

the time period before extraction, the fetal presentation type; the delivery mode and the birth weight. Indeed, the majority of our neonatal deaths have involved children born in a delay of over 2 hours after the diagnosis. These long delays before the fetal extraction are due more often: the conditions of evacuation in patients to the UH-C, the overload of the work to the UH-C making difficult immediate support, incomplete surgical kits and lack of operating materials requiring parents to go to buy some drugs in pharmacy in town, an insufficient technical platform (a single operating for busy emergencies 24/24). In literature, the authors acknowledge that the time between diagnosis and childbirth is a fundamental prognosis factor.^{2,3,7,11}

For example, for when the period before birth is more than an hour, mortality exceeds 25%, while in general the authors report a mortality of 5% when the time is less than 30 minutes.¹² The minimum time recorded in our series is 18 minutes while the maximum is 16 h with an average of 2 hours 25 minutes.

Concerning the delivery mode, the vaginal route was highly feticide if umbilical cord prolapse. We noted 82.3% of neonatal deaths in children born vaginally against 17.2% of those born by caesarean section. Thus, many authors recommend caesarean section if prolapsed, because it can reduce neonatal mortality.^{2,6,13} For all reasons, the vaginal delivery is not appropriate in the cases of UCP if imminent delivery; contrarily to the recent study of Behbehani and al at Canada.¹⁴

The fetal presentation type is also a factor of poor prognosis. The new-born dead 5 minutes from life in the cephalic presentation are more numerous than those being breech or cross presentation. But the difference is not statistically significant in our series (see table VII) unlike a study reported in the literature.¹⁰ 47.3% of fetal deaths in case of cephalic presentation against 32.4% of stillborn for other presentations. The funicular compression caused by cephalic presentation contributed to this death. According to other authors, cuts the cord in non-cephalic presentations are lower and better tolerated than in cephalic presentations.²

The low birth weight was found also as bad fetal prognosis factor. In our series, there were 71.5% of dead-born children of birth weight less than 2500 g and 19% of bad Apgar score ($p = 0.001$). It's a risk factor found in the literature.^{3,5} This accident is more deleterious to new-born with small birth weight; those are already in a precarious health state.

CONCLUSION

The umbilical cord prolapse beating is little observed at the maternity of Cocody university hospital. Obstetric attitude pending the c-section was dominated by Trendelenburg positioning. The c-section was performed in 63%. Neonatal mortality was high (41.3%). The

factors of bad fetal prognosis in our working environment were the long delay between the occurrence of the UCP and childbirth, vaginal delivery and the small birth weight. Fast care by caesarean could improve significantly the fetal prognosis. To do this, we must strengthen our technical platform.

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