THE PROFILE OF NEONATAL SEPSIS IN DUHOK CITY AND PREDICTORS OF MORTALITY: A PROSPECTIVE CASE SERIES STUDY

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ABSTRACT

Background: Neonatal sepsis is a major cause of death all over the world. Risk factors represent an interaction between maternal-fetal colonization and each of transplacental immunity and the defense mechanisms of the neonate. This study is to assess the epidemiological, clinical and laboratory profiles of neonates with sepsis in relation to outcome and to determine the predictors of outcome.

Subject and Methods: A prospective study included neonates with sepsis admitted to neonatal care unit. 126 neonates with features of sepsis were included with age ranged from (1-30) days. From each patient, neonatal and maternal data were collected and clinical features as well as laboratory test results of hemoglobin, platelets count. total white blood cell and absolute neutrophil count , C-reactive protein and blood culture were collected and statistically analyzed.

Results: of 126 neonates, 32 (25.39%) died while others survived. Age < 7 days was in 61.9% of all cases, 69.84% had respiratory distress syndrome, 7.93% had hypoxic ischemic encephalopathy, 60.31% were preterm, 61.9% were born vaginally and male to female ratio was 1.73:1. There is a significant relation of mortality to respiratory distress syndrome and hypoxic ischemic encephalopathy, preterm delivery, low birth weight and male gender. Vomiting, apnea, sclerema, cyanosis and tachypnea were significantly related to the mortality. *Eschericia coli* were the most common followed by *Klebsiella sp.* The highest mortality is with Acenatobacterbaumani followed by *Staphylococcu aureus* with a significant relation. The C reactive protein was>10 mg/dl was in higher number of neonates with sepsis who died by comparison to those who survived, with a significant relation.

Conclusions: Neonatal sepsis is still a common cause of mortality in neonates with change in the pattern of causative organisms and this requires more monitoring and periodic surveillance. There is a real need to find out the local antibiotic sensitivities of pathogens to establish an optimal empirical treatment before the results of culture and sensitivity are available.

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Keywords: Neonatal sepsis, Duhok city, A prospective case.

Neonatal sepsis is a major cause of death all over the world[1].Up to 4 million neonates die annually in developing countries most commonly due to sepsis, hypoxic ischemic encephalopathy, and consequences of prematurity and low birth weight[2,3]. The incidence of neonatal sepsis is significantly higher in developing countries than in developed ones 1-4 vs 10-50/1000 live birth[4,5]. Also, this incidence varies from a neonatal nursery to another and even it varies within the same nursery from time to time and depending

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on the predisposing conditions[6]. Risk factors represent an interaction between maternal-fetal colonization and each of transplacental immunity and the defense mechanisms of the neonate, both physical and cellular[7]. Sepsis in neonates manifests as either focal or non-specific signs and symptoms of infection[4]. The virulence of the microorganism and neonate's inflammatory response to that agent determine theclinical manifestations. The term systemic inflammatory response syndrome (SIRS) describes the unique process of infection and the subsequent systemic response[4] while the term systemic inflammatory response(SIR) describes the syndrome that includes two or more of the following: tachycardia, tachypnea, fever or hypothermia, and abnormal white blood cells in immature forms.It is important to evaluate tests for neonatal sepsis because the infection may be a serious threat to the neonate. It is urgently necessary to know if the neonate has sepsis to start treatment as early as possible[8]. There is no enough specificity and sensitivity of any single laboratory test used and therefore lab confirmation must be used in conjunction with risk factors and clinical signs[5]. The lab tests used are : blood, urine and cerebrospinal fluid culture, profile of white blood cells, platelet count, acute phase reactants (ESR, C reactive protein), latex agglutination tests, or counter immune electrophoreses, and Polymerase Chain Reaction (PCR)[4-7,9]. Synthesis of C reactive protein (CRP) increases within (4-6) hours and then doubles every 8 hours after that and peaks at 36-50 hours after the onset of inflammation. With ongoing inflammation and tissue destruction, CRP level remains high, but declines rapidly with resolution of inflammation because of short half-life (4 to 7 hrs.), so it is parallel to the degree of injury and repair and this supports its value as an acute measure of disease activity. In the serum of normal healthy person CRP is in very low concentration < 0.02 mg/dl and mostly does not exceed 6 mg/dl)[10-13]. Depending on the definition of sepsis, the mortality rate from sepsis varies. When all bacteremic infections are included in the definition, the reported mortality rate in neonatal sepsis is 10-40%[5]. To anticipate from the clinical history, to suspect from clinical presentation and to confirm diagnosis by preliminary laboratory test are essential to maintain intact survival of the neonate with sepsis[7]. To the best of our knowledge, there are no enough studies that cover this very vital subject in our locality. This study was accomplished on neonates with sepsis to assess the epidemiological, clinical and laboratory profiles of neonates with sepsis in relation to outcome (survival and mortality) and to determine the predictors of outcome.

METHODS

A prospective study was accomplished on neonates with sepsis who have been admitted to neonatal nursery at Maternity and Obstetric Hospital in Duhok city from the first of March 2015 to the first of March 2016. A total of 126 neonates with features of sepsis were included(we excluded neonates with previous use of antibiotic and those having congenital anomalies). Their age ranged from (1-30) days. The following data were taken: name, age, sex, mode and place of delivery, date of admission, gestational age

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(was assessed using Dubowitz criteria) [4], any history of acute neonatal suffering i.e. any illness during birth or soon after it such as hypoxic ischemic encephalopathy and respiratory distress. Maternal data included: history of prolonged rupture of membrane more than 24 hour, antibiotic use, fever, and urinary tract infection (UTI). Clinical features of neonates included: lethargy, poor feeding, diarrhea, coffee-ground vomiting, temperature instability, convulsion, pallor, jaundice, cyanosis, tachycardia, apnea, respiratory distress, mottled skin, sclerma, omphalitis, hepato-splenomegaly and abdominal distension. The neonates were followed throughout their presence in the hospital and were divided into those who remained alive and those who died. A sample of 0.5 ml of blood was taken from every neonate for estimation of hemoglobin, platelets count, total white blood cell and absolute neutrophil count and before antibiotic use. A sample of at least 2ml of blood per set was taken from peripheral vein from 2 separate sites after adequate disinfection of skin by iodine solution that was left to dry and then wiped off using (70%) alcohol, then the both samples were cultured aerobically and anaerobically. C-reactive protein was measured using 0.5 ml of blood collected in a plain tube without EDTA by latex-agglutination test. The cutoff value for CRP > 10mg/dl[4,5,10-13] was considered positive.

STATISTICAL ANALYSIS

Statistical analysis was done using SPSS package 20, data were expressed as mean + SD, Chi-square and exact Fisher's test were used for comparison of proportions, P-value of less than 0.05 was considered as statistically significant, P-value <0.01 as highly significant and P-value <0.001 as extremely significant.

The homogeneity of patients' age, weight, and BMI was examined through the One-way ANOVA statistical tests. The differences between sensory and motor duration among three study groups were evaluated through the One-Way ANOVA and post-hoc statistical tests and chi-squared tests for adverse effects of different doses of dexamethasone. The p-value less than 0.05 was considered as statistically significant and less than 0.01 as a clinically substantial difference. The Statistical Package for Social Sciences version 23:00 (SPSS: IBM) was used for statistical calculations.

RESULTS

Among all participants, 32 (25.39%) died while others survived. Most common age of patient was less than 7 days in 61.9% of all cases, 69.84% had respiratory distress syndrome, 7.93% had hypoxic ischemic encephalopathy, 60.31% were preterm, 61.9% were born vaginally and male to female ratio was 1.73:1. The outcome of sepsis in relation to neonates' characteristics is shown in **Table 1.** There is a significant relation of mortality to respiratory distress syndrome and hypoxic ischemic encephalopathy, preterm delivery, low birth weight and male gender.

Table 1: The Relation of Neonates' Variables to the Outcome of Neonates with Sepsis

Variables		Outcome		*P* value
		Alive 94	Dead 32	
Age (days)	<7 (78)	56(71.7%)	22(28.3%)	0.256
	7- 28 (48)	38(79.1%)	10(20.9%)	
Acute suffering	RDS* (88)	62(70.4%)	26(29.6%)	0.031
	HIE** (10)	6 (60%)	4(40%)	
	None (28)	26(92.8%)	2(7.2%)	
Gestational Age	Preterm (76)	48(63.1%)	28(36.9%)	0.0001
	Term (50)	46(92%)	4 (8%)	
Birth weight (grams)	Mean+/- SD	2288+/- 776	1825+/- 588	0.0001
	Range	900- 3800	800- 3000	
Delivery mode	Vaginal (78)	56(71.8%)	22(28.2%)	0.256
	Caesarean (48)	38(79.2%)	10(20.8%)	
Sex	Male (80)	54(67.5%)	26(32.5%)	0.009
	Female (46)	40(87%)	6(13%)	

*Respiratory distress syndrome
** hypoxic ischemic encephalopathy

The maternal characteristics include prolonged rupture of membranes that occurred in 3.17% of cases, the use of antibiotics before delivery in 7.93%, maternal fever in 9.52% and urinary tract infection in 17.46% of all cases. As shown in **Table 2**, none of these variables was significantly related to the outcome of sepsis.

Table 2: Therelation of Neonates' Variables to the Outcome of Neonates with Sepsis

Variables		outcome		*P* value
		Alive 94	Dead 32	
PROM*	Yes	4(100%)	0(0%)	0.222
	No	90(73.8%)	32(26.2%)	
Antibiotics use	Yes	8(80%)	2(20%)	0.625
	No	86(74.2%)	30(25.8%)	
fever	Yes	6(50%)	6(50%)	0.092
	No	88(77.2%)	26(22.8%)	
UTI**	Yes	16(72.8%)	6(27.2%)	0.955
	No	78(75%)	26(25%)	

*Respiratory distress syndrome
** hypoxic ischemic encephalopathy

The clinical symptoms of sepsis are presented in **Table 3.** Lethargy and poor feeding are the most frequent symptoms. Vomiting is significantly related to mortality while the other symptoms are not.

Table 3: The Role of Clinical Symptoms as Predictors of Mortality in Neonates with Sepsis

Symptoms		Outcome		Total	*P* value
		Alive 94	Dead 32		
Lethargy	Present	66(75%)	22(25%)	88	0.967
	Absent	28(73.7%)	10(26.3%)	38	
Poor feeding	present	62(73.8%)	22(26.2%)	84	0.622
	Absent	32(76.2%)	10(23.8%)	42	
Diarrhea	present	4(66.7%)	2(33.3%)	6	0.701
	Absent	92(75.4%)	30(24.6%)	120	
Vomiting	present	12(54.6%)	10(45.4%)	22	0.027
	Absent	82(78.9%)	22(21.1%)	104	
Seizures	present	12(66.7%)	6(33.3%)	18	0.483
	Absent	82(75.93%)	26(24.07%)	108	

*Respiratory distress syndrome** hypoxic ischemic encephalopathy

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Tachypnea, cyanosis, sclerema and apnea were the most frequent signs in septic neonates followed by jaundice, fever, hypothermia and abdominal distension. As shown in **Table 4,** apnea, sclerema, cyanosis and tachypnea were significantly related to the mortality.

Table 4: The Role of Clinical Signs as Predictors of Mortality in Neonates with Sepsis

Sign		Outcome		Total	P value
		Alive 94	Dead 32		
Fever	present	26(86.7%)	4(13.3%)	30	0.061
	absent	68(70.9%)	28(29.1%)	96	
Hypothermia	present	14(58.4%)	10(41.6%)	24	0.063
	absent	80(78.5%)	22(21.5%)	102	
Cyanosis	present	24(57.2%)	18(42.8%)	42	0.004
	absent	70(83.4%)	14(16.6%)	84	
Apnea	present	22(55%)	18(45%)	40	0.001
	absent	72(83.73%)	14(16.27%)	86	
Tense fontanel	present	4(50%)	4(50%)	8	0.121
	absent	90(76.3%)	28(23.7%)	108	
Tachypnea	present	38(86.4%)	6(13.6%)	44	0.017
	absent	56(68.3%)	26(31.7%)	82	
Pallor	present	14(77.8%)	4(22.2%)	18	0.653
	absent	80(74.1%)	28(25.9%)	108	
Jaundice	present	28(77.8%)	8(22.2%)	36	0.487
	absent	66(73.4%)	24(26.6%)	90	
Purpura	present	6(75%)	2(25%)	8	0.918
	absent	88(74.6%)	30(25.4%)	118	
Sclerema	present	24(57.2%)	18(42.8%)	42	0.004
	absent	70(83.4%)	14(16.6%)	84	
Abdominal distension	present	12(60%)	8(40%)	20	0.139
	absent	72(75%)	24(25%)	96	
Hepato-splenomegaly	present	2(50%)	2(50%)	4	0.281
	absent	92(75%)	30(24.6%)	122	

***Respiratory distress syndrome**
**** hypoxic ischemic encephalopathy**

According to the results of blood culture, the most common isolated bacteria were *Eschericia coli* followed by *Klebsiella sp.* and then *Non coagulase staphyllococci and* non-lactose fermenters. As in **Table 5,** the highest mortality is with *Acinatobacter baumannii* followed by *Staphylococcus aureus* and then *Escherichia coli* and *Klebsiella sp.* with a significant relation.

Table 5: The relation of the Result of Blood Culture to the Outcome of Neonatal Sepsis

Bacteria isolated	Total	Outcome	
		Alive 94	Dead 32
Escherichia coli	74	54 (72.98%)	20 (27.02%)
Klebsiella sp.	18	13 (72.23%)	5 (27.77%)
Non coagulase staphyllococci	11	11 (100%)	0 (0%)
Non lactose fermentors	11	11 (100%)	0 (0%)
Acinetobacter baumannii	4	0 (0%)	4 (100%)
Staphylococcus aureus	4	2 (50%)	2 (50%)
Gram positive cocci	4	4 (100%)	0 (0%)

***P*=0.003**

The hematologic variables are presented in **Table 6.** The mean hemoglobin, platelet count, white blood cell count and platelet count is lower in neonates who died of sepsis as compared to those who survived but no statistical significance was found.

The C reactive protein as shown also in this table is ≥10mg/dl in a significantly higher number of neonates with sepsis who died by comparison to those who survived, with a significant relation.

Table6: The Relation Between Hematological Variables and the Outcome of Neonatal Sepsis

Variables		Outcome		P
		Alive 94	Dead 32	
Hemoglobin (g /dl)		14.6+/- 3.7	13.4+/- 3.9	0.18
Platelets (cell / mm3)		176+/- 136	174.78+/- 172.15	0.075
White blood cells (cell / mm3)		15.1+/-9.48	14.4+/-9.47	0.091
Absolute neutrophil count (cell / mm3)		13.6+/-4.2	5.9+/-4.8	0.077
C-reactive protein	Positive	59	28	0.003
	Negative	35	4	

DISCUSSION

To evaluate the perinatal care in a community it is wise rely on the neonatal mortality rate to establish an effective health care delivery system. It is very essential to have an integrated statistical information about the neonatal mortality in order to develop a sound program for the early diagnosis of the neonatal sepsis and assessment of treatment and outcome[14]. Neonatal sepsis may just manifest as diverse, subtle and nonspecific signs and symptoms. If the diagnosis is not made early and treatment not started immediately, both morbidity and mortality rates rise significantly[12]. Mortality from neonatal sepsis in this study was 25.39%, which is close to the results of other studies where it was in United Arab Emirates (26%)[15], in USA[16], and Saudi Arabia it was 28%[17]. It is higher than what was found in Nigeria, where it was 19.3%[18] but the mortality is lower than two Iraqi studies where they were(44.2%)[19] and (43.5%)[20],a study in Nepal(36.95%)[21] a Saudi study (44%)[22] and Mexican study (43.9%)[23]. Many factors explain the difference in mortality rate among different countries like use of ventilators, different microorganisms, socioeconomic and racial factors, incubators, use of different antibiotics and geographical factors[15]. Although early onset sepsis is more frequent in this study and the mortality is higher than late onset, it is not significant. Other studies have proved similar results with significant differences[19,23,24] and conversely, others found late onset sepsis to be associated with higher mortality[20,25,26]. However, the causative agents in early onset sepsis mainly comes from mother's genitor-urinary tract while in late onset sepsis it comes from prolonged antibiotic use, invasive procedures and prolonged hospitalization. Male gender is a predictor of mortality in this study, which suggests the probability of sex related factors in host susceptibility. Similar results were found by other studies[17,27] while others did not find any role of sex in predilection to mortality[15,21,23].

Mostly, because of inherent immunodeficiency in premature neonates

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and the need for prolonged hospitalization in low birth weight neonates, sepsis was more common and mortality was higher in these two groups of neonates in our study. This is similar to what was found in other studies in different parts of the world[15,17,22,23, 27-29], but different from other studies[21,31] that found them not significant. Neonates who had, in addition to sepsis, other acute illnesses like respiratory distress and hypoxic ischemic encephalopathy did show a significantly higher mortality in agreement with what was found in other studies [17,23] because they need prolonged hospital stay and may be subjected to more invasive procedures. Similar to what was found in a Saudi study[22], prolonged rupture of membranes was not found frequently in septic neonates and is not predictor of mortality from sepsis, probably because the affected mothers are treated with antibiotics in such cases which seems to be protective for neonate. This is in contrast to other different studies that found it a significant factor[15,19, 24,27, 29-31].

Among presenting signs and symptoms of sepsis, predictors of mortality were apnea, cyanosis, sclerema and vomiting in accordance with other studies[1,s19,23 ,27, 30]. The causative microorganisms isolated from blood culture were most commonly *Escherichia coli* followed by *Klebsiella sp*. with similar mortality rates, while the highest rate of mortality was found with *Acinatobacter baumannii* followed by *Staphylococcus aureus.* This is similar to another study[30] but in contrast to an Iraqi study[19] where the mortality rates were *P. aeruginosa* (100%), *Staphylococcus aureus* (100%) followed by *klebsiella* (71.1%) and *E. coli* (48.5%) and other different studies showed similar results[15,20-23,26,32].The hematological variables including hemoglobin, white blood cells, absolute neutrophil count and platelets were found lower in septic neonates who died as compared to those who survived but this difference was not significant. These were found significantly lower in those who died in other studies[12,19, 23,33,34] since the toxins produced by the causative bacteria suppress the bone marrow hematopoietic process.

The mortality was higher in septic neonates with C-reactive protein level > 10 mg/dl. This agrees with other studies[10,13,19,34]. CRP has a high sensitivity and specificity with high negative predictive values and high positive predictive values as well[12].

The main limitation of this study was that serum procalcitonin was not measured for the neonates with sepsis since it is more sensitive and specific than CRP.

In conclusion, Neonatal sepsis is still a common cause of mortality in neonates. There is a change in the pattern of organisms causing sepsis in the newborn. This requires more monitoring and periodic surveillance, and there is a real need to find out the local antibiotic sensitivities of pathogens to establish an optimal empirical treatment before the results of culture and sensitivity are available.

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ثوختة

سيمايىَ ثيسبونا خوينىَ لدةف زاروكيَت سافا ل دهوك و ثيَشبينيكرنا ئةنجامىَ وىَ ذجورىَ مايلويدا دذوار هةى. ظةكولينةكا ثاشظةيىَ لسةر 105 نةخوشان

ثيَشةكى:

ثيسبوناخوينلدةفزاروكيَنسافائةطةرةكىَسةرةكيةيَمرنلسةرانسةرجيهانىَ . نيشانيَنكلينيكىَديارذكةنوةكدةظةرداريانةجورى . هوكاريَتتوشبوننبَثيسبوناخوينىَ هةظركى ية ناظا ئاكنجيبونا ميكروبى لدةف زاروكى ودايكىَ لطةل برطريا لدةف زاروكىَ سافا.

دةستنيشانكرنا سيماييَن ثيسبونا خوينىَ لدةف زاروكيَن ساظا ذ ئاليىَ ذينطةهى و كلينيكى و لابورى و ثيَكظة طريدانا وان لطةل ئةنجامىَ ظىَ ثيسبونىَ و ثيَشبينى كرنا ئةنجامى .

ريَكيَن ظةكولينىَ:

ئةظ ظةكولينة هاتة كرن لسةر زاروكيَن ساظاييَن توشبوينة ثيسبونا خوينىَ ئةويَن هاتينة نظاندن ليةكةيا ظرينكىَ لنةخوشخانا زاروكبونىَ ل دهوكىَ ذ (1 ى ئادارا 2015 بو 1 ى ئادارا 2016) ذمارا ظان نةخوشان (126) بوون كو هةميا نيشانيَن ثيسبونا خوينىَ لىَ دياربون كو ذييَن وان ذ (1 تا 30) روذابوون ذ هةر زاروكةكى ئةظ ثيَزانينيَن خوارىَ هاتنة وةرطرتن :- ناظ ، ذى ، رةطةز ، جورىَ بونىَ ، ميَذويا نظاندنىَ ، ذيىَ كورثةلةى دةمىَ بوونىَ ..... هتد . ثيَزانين ذ دايكا هاتينة وةرطرتن :- ماوىَ نابةينا ثةقينا سةرئافكىَ و بوونا زاروكى ، تا ، بكارئينانا ئةنتى بايوتيكا .... هتد .نيشانيَن توشبونىَ لدةف زاروكى هاتنة توماركرن . زاروك هاتنة دابةشكرن بو ئةويَن ماينة دذيانىَ دا و ئةويَن مرين . خويَن هاتة كيَشان ذ هةر زاروكةكى ذ بو جاندنا خوينىَ و هةروةسا ثيظانا هيمو طلوبينىَ و تةبكيَن خوينىَ بيَن سثى و اقراصا و CRP . ئةنجام هاتنة شروظةكرن بريكا سيستةمىَ SPSS كو $p<0.05$ ياطرنطة.

ئةنجام:

ذ 126 بةشدار بويان ، 32 (25.39 %) مرن ذيىَ كيَمتر ذ 7 روذا لدةف (61.9 %) ذ وان بو . تةنطةييَن بينى لدةف (69.48 %) هةبوو توشبونا ميَشكى لدةف (7.93 %) هةبوو . بوونا ثيَشوةخت (ظرنيكى) لدةف (60.31 %) هةبوو . (61.9 %) ذ بةشداربويان سروشتى ببوون . ريَذا نيَر بو مىَ (1.73:1) ثيَكظة طريَدانا طرنط هةبوو نابةينا مرنىَ و هةرئيَك ذ تنطة بينى ، توشبونا ميَشكى ، بونا ظرينكى ، كيَشا كيَم دةمىَ بونىَ و رةطةزىَ نيَر . ماوىَ دريَذ نابةينا ثةقينا سةرئاظكىَ وبونىَ لدةف (3.17 %) هةبو . (3.93 %) ذ دايكان ئةنيتىَ بايوتيك بكارئينابون . تا لدةف (9.52 %) ذ دايكا هةبو . (17.46 %) ذ دايكان هةودانا ميزةروو يان هةبو يىَ ثيَطظة طريَدانا طرنك . ثترين نيشان لدةف توشبويان :- خاظى ، كيَم خارن ، ثيَنا بلةز ، شين بون ، رةق بون و راوستانا بيَتى . ثيَكظة طريَدانا طرنك هةبو نابةينا مرنىَ و هةرئيَك ذ دل رابونىَ ، راوةستانا يننىَ ، رةقبونىَ ، شين بونىَ و بيَنا بلةز . ثترين ميكروب (*E. coli*) بو ثاش (*Klebsiella spp.*) بو ، ثترين ريَذا مرنىَ لكه ل (Acenatobacter) بو ثاش (*Staph aureus*) ثيَكظة طريَدانةكا طرنط . هةرئيَك ذ هيمو طلوبين و اقراص و تةثكيَن سثى كيَمتر بون لدةظ ئةويَن مرين بةس نةياطرنط بور(CRP) ثتر ذ (10) ملغم/ دل ثتربو لدةف مريان .

دةرئةنجام:

ثيسبونا خوينىَ هيَشتا ئةطةرةكىَ طرنطة بو مرنىَ لدةف زاروكيَن ساظا لطةل طهورينا جورى ميكروبان ئةظةذى ثيَويستة كو ديظجونا لدويف بيَتة كرن . طةلةكا طرنطة جورىَ ئةنيتبا يوتيكيَن كاريطةر بهيَتة دياركرن داكو بشيَوةيةكىَ نموونةيى بهيَتة دان بةرى ئةنجاميَن خاندنا خوينىَ .

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الخلاصة

صورة انتان الدم عند حديثي الولادة في دهوك ومتنبئات الوفاة

الخلفية والأهداف: انتان الدم عند حديثي الولادة سبب رئيسي للموت في جميع انحاء العالم , تظهر علاماته السريرية بشكل اعراض موقعية او غيرمحددة للانتان , عوامل الخطورة الممهدة لانتان الدم تمثل تداخلا بين الاستيطان الجرثومي للام و الطفل وبين المناعة المنتقلة خلال المشيمة و اليات الدفاع عند حديث الولادة .
اهداف البحث هوتحديد مواصفات حديثي الولادة المصابين بأنتان الدم من الناحية الوبائية و السريرية و المختبرية وارتباطها بنتيجة هذا الانتان و تحديد المتنبأت بالنتيجة.

طرق البحث: شملت الدراسة الاطفال حديثي الولادة المصابين بإنتان الدم الذين ادلخلوا الى وحدة العناية لحديثي الولادة في مستشفى الولادة في دهوك للفترة من (1 أذار 2015 الى 1 أذار 2016) شملت الدراسة 126 طفل حديث الولادة تظهر عليهم علامات الاصابة بإنتان الدم مع استثناء الاطفال الذين اعطوا مضادات حيوية و المصابين بتشوهات خلقية . تراوحت اعمار المشمولين بين (1-30) يوم ، اخذت من كل طفل مشترك المعلومات الاتية : الاسم . العمر . الجنس . طريقة الولادة . تاريخ الدخول . العمر الجنيني عندة الولادة . اصابات حادة مثل متلازمة عسا النقس او اعتلال الدماغ الناتج عن قلة الدم و الاكسجين للدماغ ، المعلومات المأخوذه من الام شملت : فترة طويلة فاصلة بين تمزق الاغشية والولادة ، استعمال المضادات الحيوية . الحمى التهاب المجاري البولية . تم تسجيل العلامات السريرية ايضاً و تم تقسيم المرض الى احياء ومتوفين . اخذت من كل طفل عينة من الدم لاجراء فحوص مكونات الدم ، البروتين التفاعلي ، وزرع الدم الهوائي و اللاهوائي، ثم تحليل النتأج احصائياً بأستخدام نظام (SPSS حيث P<0.05اعبرت مهمة احصائياً.

النتائج: من اصل 126 مشارك توفي 32 (25.39%) . عمر المصابين اقل من 7 أيام من 61.9% من الحالات . عسر التض وجد عند 69.48% امتلال الدفاع عند 7.93% . والولادة الحذية وجدت عند 60.31% . والولادة المهبلية وجدت عند 61.9% من الحالات . الذكور الى الاناث 1.73:1وجد ارتباط هام احصائياً بين الوفيات وكل من عسر التنفس . اعتلال الدماغ . الولادة الخديجةز قلة الوزن عند الولادة وجنس الذكر .الفترة الطويلة بين تمزق الاغشية و الولادة وجدت عند 3.17% من الحالات . استعمال المضادات الحيوية من قبل الام قبل الولادة وجد عند 3.93% من الحالات . الحمفي 9.52% من الحالات والتهاب المجاري البولية عند 17.46% من الحالات و لكن دون وجود ارتباط هام احصائياً . اكثر العلامات السريرية شيوعاً عند المصابين هي الخمول قلة الرضاعة تسارع اتننفس . الازرقاق . التصالب و توقف التنفس . اكثر الجراثيم شيوعاً عند المصابين كان *E. coli* ثمKlebsiellaspp. اعلى نسبة وفيات كانت من Acenatobacter ثم *Staph. aureus*مع ارتباط هام . معدل الهيموكلوبين و الاقراص و الكريات البيضاء كل اقل عند المتوفين دون علاقة هامة . البروتين التفاعلي> 10 ملغم /دل كان اكثر شيوعيا عند المتوفين مع علاقة هامة.

الاستنتاجات: اتنان الدم لايزال سبباً مهماً للوفاة عند الولادة مع تغير نمط الجراثيم اومسببة مما يتطلب مزيداً من المراقبة والاستقصاء الدوري . هناك حاجة حقيقية لإيجاد حساسية الجراثيم للمضادات الحيوية لغرض بدأ عيلاج تجريبي مثالي قبل نتائج الزرع والحساسية للجراثيم .