Sepsis incidence and its risk factors in very low birth weight infants

A retrospective, observational investigation

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Introduction

During the past 4 decades, remarkable advances in medicine have improved the survival of very low birth weight (VLBW) infants (birth weight 1001-1500g) and extreme low birth weight (ELBW) infants (birth weight ≤ 1000g) (Pessoa-Silva, Posfay-Barbe, Pfisters, Touveneau, Perneger, & Pittet, 2005). This has created a population at high risk for nosocomial sepsis (NS) (Pessoa-Silva, et al, 2005). NS is late-onset sepsis (appearing after the first 72h of life) in hospitalized infants (Clark, Powers, White, Bloom, Sanchez, & Benjamin, 2004) and is one of the leading causes of morbidity, mortality, and longer duration of hospital stay in the neonatal intensive care unit (NICU) (Clark et al., 2004 and Rogers, Alderdice, McCall, Jenkins, & Craig, 2010). Birth weight is strongly associated with risk of late-onset sepsis. Stoll et al. showed an average rate of NS of 34.6% for ELBW infants, and 11.0% for those weighing 1001 to 1500gr, compared with 0.1% in term infants, in America. (Stoll, Hansen, Fanaroff & et al. 2002). However, this study presented numbers of 2002. Currently, the rate of NS may increased with the current improving survival of ELBW and VLBW infants, since the risk of NS is inversely proportional to birth weight, (Perlman, Saiman, & Larson, 2007).

There are several external risk factors of NS in VLBW and ELBW infants, however some of them are of vital supporting. Perlman et al. conducted one of the largest prospective studies into the risk factors in the same subgroups as investigated in this study and concluded that the presence of a central venous catheter (CVC) is a first significant predictor of infections (Perlman, 2007). The National Nosocomial Infections Surveillance System has reported rates of 5.4-9.1 of umbilical and central line-associated infections per 1000 catheter days for VLBW infants and ELBW infants (NNIS, 2004). Nevertheless, infants often require CVCs for long-term venous access to provide total parenteral nutrition (TPN), medication, transfusion and repeated blood sampling (Hoogen, van den, Brouwer, Gerards, Fleer, & Krediet, 2008; Veguta, Loethen, Wallace, Albert, & Pearl, 2005). Hence, CVCs are of vital supporting (Breschan, Platzer, & Likar, 2009).

Secondly, TPN is reported by Perlman et al. (2007) as a significant predictor of infections, as well. Among infants with CVCs, those who received TPN were 4.7 times more likely to have an infection than those who did not receive TPN (Perlman et al., 2007). However, a critical note must be that they mentioned that although both CVC and TPN use have been associated with NS, the independent contribution of TPN given the presence of a catheter has been less clear. A period of TPN is often required before enteral feeding is tolerated in VLBW infants (Bjornvad, Thymann, Deutz, & et al., 2008). These researchers advocated that TPN improves neonatal hemodynamic and metabolic stability, prevents Necrotizing Enterecolitis development, and accelerates body growth.

The third external risk factor of developing NS is bad adherence to hand hygiene. The hands of NICU personnel are important vectors of pathogens from colonized or infected infants to susceptible infants (Saiman, 2006). A study indicated that each observed nurse was carrying a high average of 7.0 (range 1-8) bacterial cultures, such as staphylococci, during the care for neonates (Cook, Cimiotti, Della-Latta, Saiman, & Larson, 2007). Prevention of health care-associated infections is partly based on strategies which interrupt transmission of healthcare workers (HCWs) (Jarvis, 2004). These strategies include hand hygiene (Borghesi & Stronati, 2008). The state of adherence to hand hygiene protocols at the NICU at the Dutch hospital under study (further named: the NICU)was established by a short study, performed from August-November 2011 (data not published). An increased adherence to hand hygiene from 50 to 67% was observed.

Problem statement

Since 1978 the NS occurrence at this NICU is registered. The long-term trends were published in 2010 (Hoogen, van den, Gerards, Verboon-Maciolek, Fleer & Krediet, 2010a). An increase of the NS incidence was noticeable: from 7.1% in period 1988-1992 to 13.9% in period 2002-2006 (Hoogen, van den, et al. 2010). However, these were the numbers of NS in all hospitalized infants, and not only in the VLBW and ELBW infants. The increase was found to be too high by the HCWs. (Hoogen van den, Brouwer, Malgorzata, Verboon-Maciolek, Gerards, Fleer, & Krediet, 2010b). Therefore, investigations were conducted into NS and the risk factors (Hemels, Hoogen, van den, Malgorzata, Verboon-Maciolek, Fleer, & Krediet, 2011; Hemels, Hoogen, van den, Verboon-Maciolek, Fleer, &Krediet, 2011a & 2011b; Hoogen, van den, et al., 2008; Hoogen van den, et al, 2010a&b). Since 2008, care policy of HCWs has changed at this NICU, as a result of gained knowledge. Including the care policy of nurses. For example, better practice regarding CVCs by avoiding the insertion and limiting the duration of an indwelling catheter (Hemels et al., 2011) and better practice regarding hand hygiene (Hoogen, van den, 2010). Since nurses have intense patient contact, improvement of health care requires continuous assessment of behavior and interventions such as observation and feedback. For this reason, health care results and updates on the NS rate were constant issues during monthly nursing meetings at this NICU. (Hoogen, van den, et al, 2010). However, in spite of all those studies and feedback, the state of NS incidence and the use of major risk factors: CVC and TPN, through the years 2008-2011 was not studied since. Therefore, this study was conducted to assess the result of the changed policy regarding the incidence of NS and Catheter Related Sepsis (CRS). As adherence to hand hygiene was observed recently, this was left out of consideration of this study.

Aim

The aim of this study was to evaluate the changed care policy of physicians and nurses with regards to decreasing the rate of NS and CRS in ELBW and VLBW infants, since 2008. The results of this study

will be presented during monthly nursing meetings in order to enlarge the nurses' awareness of the quality of their performed care.

Research question

The question to accomplish this objective was 'did changing practice since 2008, result in a decrease of the incidence of NS and CRS among ELBW and VLBW infants hospitalized in the NICU, in the period of 2008-2011?'

Method

Setting

A retrospective, observational study was conducted in the NICU. This design was chosen so the infants would not run the risk of adverse events. Other reasons were the possibility to collect data about outcome and determinants occurring in the past (Polit & Beck, 2008), and the suitability of this design to calculate an incidence rate (Koretz, 2007).

The NICU under study is a 28-bed unit with roughly 600 annual admissions, covering an area with 30,000 live births per year (Hoogen, van den, et al., 2010). The beds are divided into 4 units: 3 intensive care units and 1 high care unit. The study was approved by the local medical ethic committee and the management of the NICU. The recruitment and consent of this study was conducted in accordance to the policy of the UMCU. With informed consent of parents/guardians data of the admitted infants were used. When an objection form was signed by the parents/guardians the file would be excluded prior to data collection.

All VLBW and ELBW infants, with a first admission to the NICU for at least three days, between January 2008 and December 2011, without occurrence of sepsis within the first 72h of live, were eligible for the study. Exclusion criteria were transfer from another hospital with an NS, a hospitalization shorter than three days directly after birth, and no inform consent of the parents. To strengthen the power of this investigation, all eligible infants were included. No sample was drawn.

Data collection

Data collection was performed by manually searching through the electronic medical files, stored in the Patient Data Management System (PDMS) and Chipsoft-EZIS. In addition, diaries, kept by HCWs of the NICU were used. Every study parameter which was described in files or diaries was recorded in the program Statistical Package for the Social Sciences (SPSS) 19.

The following demographic and clinical data were gathered as baseline information to assess the generalizability of the results: gestational age, birth weight, gender, delivery mode, length of hospital

stay in days, and mortality. In addition, surgery in infants during their hospitalization was registered as well, regardless of indication. The main study parameters were NS incidence, CRS, and the duration of CVC and TPN.

Diagnose of NS was based on clinical signs of infection, after 72h of live: apneic attacks, bradycardia, respiratory distress, tachycardia, hypotension, diminished peripheral circulation, poor skin color, lethargy, irritability, feeding problems, abdominal distension, fever, and temperature instability, accompanied by elevated plasma C-reactive protein (CRP) (value ≥ 10 mg/L) levels and a positive blood culture (Hemels et al., 2011).

We also determined CRS, classified as the rate of CRS per 1000 catheter days. CRS was defined as a sepsis occurred during the use of CVC or occurred within 48 hours after removal of CVC. The rate of infections per 1000 catheter day was computed by the number of infants with a CRS divided by the sum of catheter days of all infants.

The duration of CVC was counted regardless the type of treatment, place of insertion, and type of catheter. Cut off point of one catheter day was a minimum of 12.00h. The duration of TPN was counted regardless quantity and type of TPN.

Statistics

This study generated dichotomous and continuous data. Data were categorized into four eras: 2008-2009-2010-2011, based on the research questions. Chi-squared test was used for dichotomous variables and the pooled t-test or ANOVA (corrected with the Bonferroni procedure) for continuous variables in order to calculate significance of differences and associations. In the situation of missing data, the cases were deleted selectively, on a variable-by-variable basis. Meaningful numerical values such as average, median, and percentages were computed without the cases which did not provided information about the relevant variable. Missing values of the main parameter duration of TPN was handled dissimilar, whereas a large proportion (n=31 out of 182) was missing in the year 2008. These missing data were handled by imputation. The duration of TPN was computed with the known duration of CVC. Computation was based on a formula which was build up with the linear regression method, of which the other 729 cases were used for.

Significance required a 2-sided *P* value <0.05. Statistical analyses were performed using SPSS 19, and checked by an expert from the field.

Results

A total of 2542 admissions to the NICU took place during the years 2008-2011. Of these 2524 infants, 760 met the inclusion criteria. The VLBW and ELBW infants, with a first admission to the NICU for at

least three days, with informed consent from parents/guardians, without sepsis within the first 72h of life, and without sepsis before admission, were eligible for study. No numbers withdrawn because of no inform consent. Figure 1 shows the enrollment of subjects, the reasons for exclusion, and the distribution among the four years.

Figure 1: Subject enrollment.

Clinical characteristics

Table 1: Clinical characteristics of included ELBW and VLBW infants.

Table 1 shows marginal differences among the years. Type of birth and gender were about equally distributed. Gestational age, birth weight, and surgery decreased. Whereas length of stay and mortality showed an increase. The SD of length of hospital stay increased from 20.8 for 2008 to 28.8 for 2011. Differences were tested for significance. No significant difference was calculated.

NS and CRS incidence

Table 2: NS and CRS incidence in included ELBW and VLBW infants

The calculations of the main study parameters are shown in Table 2. A trend was noticeable in NS incidence and the CRS incidence. The incidences decreased during the years. The difference in NS between 2008 and 2011 was significant (P=0.031).

The difference in CVC duration between year 2008 and 2010 and year 2009 and 2010 was also calculated as significant; respectively P= 0.026 (CI; 0.1-3.5) and P= 0.027 (CI; 0.1-3.5). The difference in TPN duration between year 2008 and 2010 was calculated as significant; P= 0.049 (CI: 0.06-4.1). In addition, a correlation was measured between CVC duration and sepsis and TPN duration and sepsis; the longer the duration, the higher the sepsis incidence. These correlations were both significant, P-value< 0.001.

Distinction between infants with birth weight ≤1000 gr. and > 1000-1500gr.

Table 3: Division of birth weight into characteristics and main parameters.

Differences between the groups are presented in Table 3. Significant differences were computed for surgery, mortality, and NS incidence, respectively: <0.001, 0.001, and 0.001. In addition, significant differences were found for length of hospital stay, CVC duration, and TPN duration. P values were respectively: <0.001 (CI: 17.4-24.5), <0.001 (CI: 0.9-2.7), <0.001 (CI: 1.3-3.4).

Secondary analyses

Secondary analyses have been conducted in order to generate a better understanding of data and generate associations between variables. There was found a significant correlation between delivery

mode and the duration of hospitalization (P=0.02, CI:0.7-8.0). The hospitalization was shorter in infants born through a Cesarean Section, with a mean difference of >4.5 days. No association was found between delivery mode and duration of CVC, TPN, or NS incidence.

In addition, multiple correlations were computed with regard to surgery, regardless of the type of surgery. Hospitalization, CVC duration, and TPN duration was significant longer in infants who underwent surgery. P-values were respectively <0.001 (CI: 14.3 – 25.1), <0.001 (CI: 2.4 – 5.1), <0.001 (CI: 2.5 – 5.6). The mortality was higher in infants who underwent surgery (P=0.001, CI: 0.03 - 0.1). however, sepsis incidence was significant lower in infants who underwent surgery (P<0.001, CI: -0.04 - -0.001). The three main indications of surgery were Necrotising Enterocolitis, inguinal hernia, persistent ductus arteriosis, and insertion of a reservoir to obtain cerebral fluid (Rickham drain).

Discussion

Our results showed a decrease of NS and CRS incidence among ELBW and VLBW infants during the years 2008-2011, at the NICU. This was obtained, when the care policy of physicians and nurses was changed, since 2008. The decrease of NS and CRS was probably gained by the decrease of duration of CVC and TPN during the years, whereas the mean birth weight and gestational age was not changed significantly. Computed correlations showed a decrease of sepsis with a decrease of duration of CVC and TPN. Also, another factor of the decrease of NS and CRS incidence could be the improved adherence to hand hygiene, observed in a previous study. The findings are corresponding with previous literature. Adherence to hand hygiene of professionals at the NICU is recognized as one of the most important means of preventing NS and CRS (Helder & Latour, 2009; Capretti, Sandri, Tridapalli, Galletti, Petracci, & Faldella, 2008). Stoll et al. (2002) and Perlman et al. (2007) reported that minimization of the use and duration of CVC and TPN would decrease the risk of sepsis. However, Perlman et al (2007) critically mentioned that although both CVC and TPN use have been associated with NS, the independent contribution of TPN given the presence of a catheter has been less clear. A more recent study of Payne et al. (2011) presented a decrease of NS after a multi-intervention program, including reducing the duration of CVCs and TPN, and increasing of compliance of hand hygiene. (Payne, Barry, Berg, Brasel, Hagen, Matthews, McCullough, et al., 2011). However, these investigators hypothesized that their other interventions may reduced NS, and as a consequence CVC and TPN were needed less often and shorter.

A closer look to the trends in NS and CRS incidence and duration of CVC and TPN, shows us a remarkable finding, which is presented Table 2. The decrease in duration of CVC and TPN between the year 2008 and 2011 was not significant, conversely the decrease between 2008 and 2010 was. In

addition, the NS incidence and mortality were the lowest in the year 2010. Striking, is the increase of all of these parameters in 2011. For the researchers, this is an incomprehensible phenomenon. A search for an explanation or correlation in raw data and literature was unprofitable. Birth weight and gestational age were the lowest in the year 2011. One hypothesis is that although the population change in 2011 was not significant, it was clinical relevant, and large enough to influence the parameters. The population change could be result of the new policy to treat infants born with a gestational age of 24 weeks, introduced by the Ministry of VWS in October 2010 (NVK, 2010). This hypothesis is strengthen with the findings of this study and previous literature. This study showed the enlarged vulnerability to NS and CRS of infants with a birth weight ≤1000 gr. due to a significant longer duration of hospitalization and the use of CVC and TPN. Younger and smaller infants are more vulnerable and are in a greater need of CVC and TPN and have a higher mortality rate (Stoll et al., 2002; Perlman et al., 2007). An Indian study advocated that ELBW infants are particularly susceptible to NS, probably due to immature immune function, increased use of devices including catheterization, and prolonged hospital stay (Narayan, Aggarwal, Upadhyay, Deorari, Singh, & Paul, 2003). Perlman et al. (2007) complemented this with the conclusion that the risk of NS is inversely proportional to birth weight, the rate of NS may increase with the current improving survival of ELBW and VLBW infants.

Secondary analyses provided new information. Unforeseen, we found a correlation between the delivery mode and length of hospital stay. Infants, delivered by a Cesarean Section had a significant shorter hospitalization. A search for literature presented us only one investigation which studied length of hospitalization in connection with delivery mode. It advocated a significant longer length for Cesarean births in comparison with vaginal births (Sangkomkamhang, Pattanittum, Laopaiboon, & Lumbiganon, 2011). This is inconsistent with our findings. However, Muhuri, MacDorman, and Menacker (2006) advocated that, among other things, perinatal infections was a cause of death for which the odds of neonatal death were significantly lower for Cesarean births than for those delivered vaginally. Mode of delivery is an important determinant of mother-infant transmission of microorganisms (Lin, Kao, Hsu, Mizokami, Hirano, & Chen, 1996;). Researchers have shown that elective cesarean may be associated with a decreased risk of transmissions. (European Collaborative Study, 1994). Since infections increase the length of hospitalization, a decrease of perinatal infections could be a explanation of the shorter hospitalization in connection with delivery mode in this study.

Additional new information was that infants who underwent surgery had a significant lower NS incidence than children without a surgery. This is inconsistent with the results found in the literature, which presented that children who underwent surgery would have more NS. Gestational age and the length of hospital stay were advocated as independent risk factors associated with NS in surgical

neonates (Perlman, 2007; Muratovskaa, Sajkovskia, Piperkovab, Sofijanovaa, Kojica, Spasevskaa, Aluloskab, et al., 2010). No further literature was found, which could confirm our findings. An explanation of our results was not acquired.

This study had strengths and limitations which must be considered when assessing the reliability and validity of the study results. A strength of this study was the intern and extern validity. There exist four threats to internal validity: selection bias, measurement bias, attrition bias, performance bias (Polit & Beck, 2008). Given that this study was a retrospective file research, none of the biases were applicable. The construct validity was enhanced by a careful conceptualization of the parameters. The parameters were strictly described so there was no uncertainty how to measure them, accordingly the parameters were measured unambiguously during the study. This can strengthen the mechanisms for translating the resulting evidence into practice (Polit & Beck, 2008). In addition, due to the large heterogeneous population and the real-world circumstances, the results can be generalized to a larger population (Polit & Beck, 2008) outside the hospital under study. A limitation would be the design. An observational design is not the most strongest design and does not provide the strongest evidence (Polit & Beck, 2008). However, an intervention study with the risk of adverse events is not allowed in infants according to the principles of the Declaration of Helsinki (version: Seoul, October 2008) and in accordance with the WMO.

Conclusion

This retrospective observational study among 760 infants showed a decrease of the incidence of NS and CRS among ELBW and VLBW infants hospitalized in the NICU in the period of 2008-2011. This is an important result of the changing care policy of physicians and nurses. It emphasizes that serious evaluation of care policy can result in better practice.

Recommendations

We recommend to conduct a multi-center study in order to investigate the incidence of NS and CRS and the care policy of physicians and nurses in connection with these incidences in Dutch centers. This could result into a summery of incidences and on going care policies, which can contribute to an assessment of those policies and to development of the best clinical practice in connection with NS and CRS in ELBW and VLBW infants.

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Tables

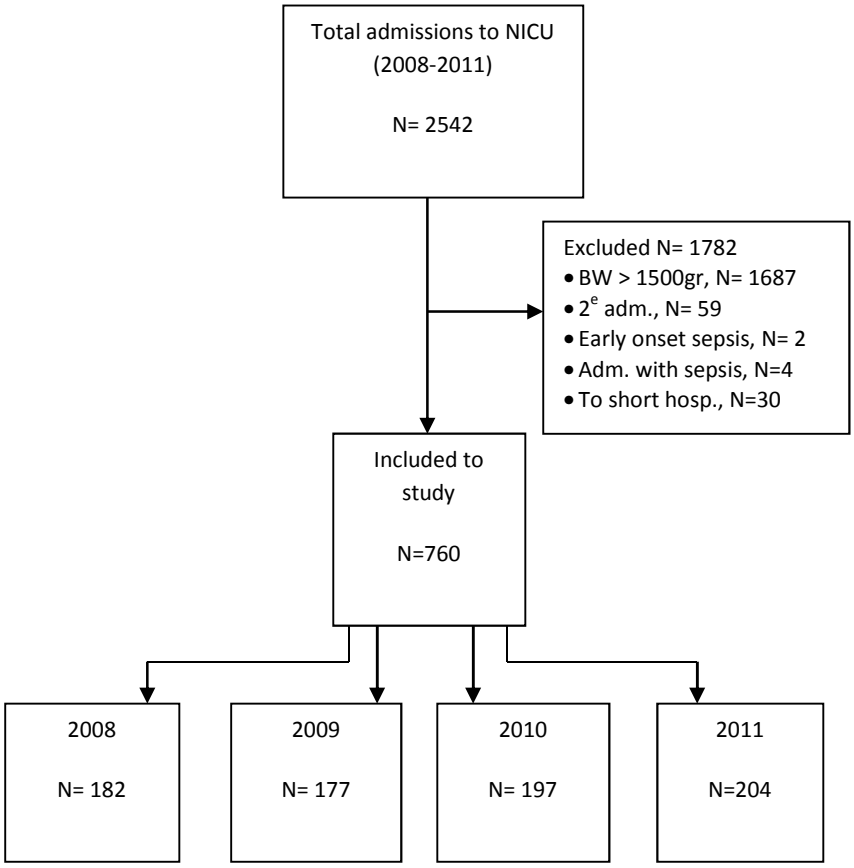

Figure 1: Subject enrollment. Adm.= admissions, BW= birth weight, hosp.= hospitalization.

Table 1: Clinical characteristics of included ELBW and VLBW infants.

	2008 (n=182)	2009 (n=177)	2010 (n=197)	2011 (n=200)
Gestational age, week (mean SD)	29.2 ± 2.3	29.2 ± 2.4	28.9 ±2.5	28.7 ± 2.4
Birth weight, grams (mean SD)	1123 ± 234	1124 ± 246	1107 ±245	1080 ± 259
Gender (Male/Female) n (%)	94 (51.6)/88 (48.4)	88 (49.7)/ 89 (50.3)	91 (46) / 106 (54)	100 (50) / 100 (50)
Delivery mode (CS) n (%)	94 (51.6)	104 (58.8)	110 (55.8)	116 (58.0)
Surgery during admission n (%)	26 (14.3)	21 (11.9)	25 (12.7)	19 (9.5)
Hospital stay, days (mean SD)	27.6 ±20.8	30.8 ±25.8	27.7 ±24.6	29.7 ± 28.8
Mortality incidence (n (%))	6 (3.3)	8 (4.5)	6 (3.0)	11 (5.5)
Abbreviation: CS= Cesarean section				

Table 2: NS and CRS incidence in included ELBW and VLBW infants.

	2008 (n=182)	2009 (n=177)	2010 (n=197)	2011 (n=200)
NS incidence n (%)	48 (26.4)	40 (22.6)	33 (16.8)	34 (17.3)
CRS per 1000 catheter days	21.8	23.1	19.6	17.3
CVC duration, days (mean SD sum)	7.6 ± 6.2 1374	7.6 ± 5.3 1343	5.8 ± 3.8 1125	7.2 ± 7.6 1448
TPN duration, days (mean SD sum)	11.2 ± 6.8 2012	10.7 ± 5.8 1865	9.3 ± 4.6 1698	10.3 ± 9.0 2021

Table 3: Division of birth weight into characteristics and main parameters.

	≤1000 gr. (n=266)	>1000-1500gr. (n=476)	P-value
Gestational age, week (mean SD)	27.2 ± 2.05	30.0 ± 2.0	<0.001
Birth weight, grams (mean SD)	833 ± 124	1260 ± 142	<0.001
Gender (Male/Female) n (%)	124 (46.6) / 142 (53.4)	244 (51.3) / 232 (48.7)	0.184
Delivery mode (CS) n (%)	146 (54.9)	272 (57.1)	0.552
Surgery (during admission) n (%)	49 (18.4)	38 (8.0)	<0.001
Hospital stay, days (mean SD)	42.7 ± 29.3	21.7 ± 19.1	<0.001
Mortality incidence n (%)	20 (7.5)	11 (2.3)	0.001
NS incidence n (%)	77 (28.9)	78 (16.4)	<0.001
CRS per 1000 catheter days	25.3	16.9	<0.001
CVC duration, days (mean SD sum)	8.3 ±7.1 2210	6.4 ± 5.1 3080	<0.001
TPN duration, days (mean SD sum)	11.9 ± 8.4 2986	9.5 ± 5.7 4287	<0.001
Abbreviations: CS= cesarean section			

Dutch summary

Titel: Sepsisincidentie en de risicofactoren bij prematuren met een zeer laag geboortegewicht. **Inleiding:** Pasgeborenen met een laag geboortegewicht hebben een risico op het krijgen van een nosocomiale sepsis (NS) en katheter gerelateerde sepsis (KGS). NS heeft een groot aandeel in morbiditeit, mortaliteit en langere ziekenhuisopnames van kinderen op de neonatale intensive care unit (NICU). Het gebruik van centraal veneuze lijnen (CVL), totaal parenterale voeding (TPV) en slechte handhygiëne zijn risicofactoren op het ontstaan ervan. Sinds 2008 is er een toegenomen bewustzijn ten aanzien van NS incidentie op de NICU dat in deze studie onderzocht werd. Gekenmerkt door de hoeveelheid onderzoeken die gedaan zijn vanaf 2008, op de desbetreffende afdeling. Deze onderzoeken hebben geleid tot veranderingen in de zorg ten aanzien van NS incidentie. Resultaten zijn nog niet onderzocht. **Doel en onderzoeksvraag:** De veranderde zorg ten aanzien van de KGS en NS evalueren. Onderzoeksvraag is 'heeft het sinds 2008 veranderde zorgbeleid geresulteerd in een afname van de NS en KGS incidentie onder kinderen met een zeer tot extreem laag geboortegewicht, opgenomen op de NICU, in de periode 2008-2011?'. **Methode:** Retrospectief observationeel dossier onderzoek. De populatie is pasgeborenen met een zeer laag geboortegewicht, opgenomen op de NICU tussen 2008-2011. Iedere pasgeborenen die voldeed aan de inclusiecriteria werd meegenomen in het onderzoek. De studieparameters waren: KGS en NS incidentie en het gebruik van CVL en TPV. **Resultaten:** Afname van NS en KGS bij een afname van de duur van CVL en TPV is waargenomen. **Conclusie:** Deze afnames zijn resultaat van het veranderde zorgbeleid. Het benadrukt dat evaluatie van de zorg kan resulteren in betere zorg. **Aanbevelingen**: een multi-center studie naar NS en KGS incidentie met het uitgevoerde zorg beleid kan bijdragen aan ontwikkeling van de beste klinische zorg ten aanzien van NS en KGS. **Sleutelwoorden:** Nosocomiale Sepsis, laag geboorte gewicht, CVL, TPV.

English abstract

Title: Sepsis incidence and its risk factors in Very Low Birth Weight Infants. **Background**: Very low birth weight (VLBW) and Extreme Low birth weight (ELBW) infants are at high risk for nosocomial sepsis (NS), which is one of the leading causes of morbidity and mortality in the neonatal intensive care unit (NICU). Total parenteral nutrition (TPN), central venous catheter (CVC), and non compliance to hand hygiene are major risk factors of NS. Since 2008, raised awareness at the healthcare workers of the NICU of the hospital under study was noticeable by multiple conducted investigations into NS and its risk factors. This resulted in changed care policy regarding NS incidence. Results of the changed policy were not studied. **Aim and research question:** To evaluate the changed care policy with regards to decreasing the rate of NS and Catheter related sepsis (CRS). Question was 'did changing practice since 2008, result in a decrease of the incidence of NS and CRS among VLBW infants hospitalized in the NICU, in the period of 2008-2011?' **Method:** Retrospective observational file research. Study population was VLBW infants, hospitalized in the NICU. All eligible subjects were studied. Main study parameters were NS and CRS incidence, and use of TPN and CVC. **Results:** The population did not change during the period. However a decrease of NS and CRS was showed, in combination with a decrease of duration of CVC and TPN. **Conclusion:** These decreases might be a result of the changing care policy. It emphasizes that serious evaluation of care policy can result in better practice. **Recommendations**: Multi-center study into NS and CRS incidences and with going care policy, would contribute to development of the best clinical practice in connection with NS and CRS in VLBW infants. **Keywords:** Nosocomial Sepsis, VLBW infants, CVC, and TPN.