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Implementation of aseptic technique training and assessment to reduce the incidence of chorioamnionitis in laboring patients

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Abstract

Chorioamnionitis may significantly affect the outcome of positive birth experiences for expecting mothers. The purpose of this quantitative, quasi-experimental quality improvement project was to determine if the implementation of the University of Michigan's Assessment Tool for Aseptic Technique and Assessment would impact the rate of maternal chorioamnionitis among laboring women admitted in a labor and delivery unit in a local Californian hospital over 30 days. Neuman's system theory, Watson's caring theory, and the plan, do, study, act (PDSA) cycle were the theoretical and conceptual underpinnings of the project. Data on chorioamnionitis rates were collected from a sample of women (n=856) using the California Maternal Quality Care Collaborative (CMQCC) source approach. Analyses revealed a statistically significant improvement in chorioamnionitis rates ($\chi 2$ (1, n=856) = 29.55, p =.001). The clinical implication was that fewer laboring mothers were diagnosed with maternal infections following the implementation of the Aseptic Technique Intervention.

Keywords: Chorioamnionitis; Aseptic technique; Quality Improvement (QI); PDSA; Neuman's system theory; Watson's caring theory

1. Introduction

The purpose of this quantitative, quasi-experimental quality improvement project was to determine if the implementation of the University of Michigan's Assessment Tool for Aseptic Technique and Assessment would impact the rate of maternal chorioamnionitis among laboring women admitted in a high acute level III labor and delivery unit in a local hospital over 30 days. The incidence of chorioamnionitis among laboring women in this local hospital presented a challenge.

The California Maternal Data Center (CMQCC) [1] reported that for a three-month period 7.5% of 630 pregnant first-time nulliparous term singleton, vertex (NTSV) women had an occurrence of chorioamnionitis while under care at this facility. This observation represented a total of 47 nulliparous women who were positive for chorioamnionitis and suggested a need for implementing a corrective action plan to improve patient outcomes. The incidence of chorioamnionitis among laboring women in the United States is about 10% [2]. In California, the incidence rate of chorioamnionitis among all maternal cases was 4.3% compared to the 7.5% rate at the local hospital facility in question [1] additionally, the rate of chorioamnionitis in nulliparous women in California was 9.2%, compared to 14.6% at this local hospital facility [1]. Therefore, the aims of this direct practice improvement (DPI) project were to reduce nosocomial infection by preventing transmission of microorganisms present on hands, surfaces, and equipment to susceptible sites and at-risk laboring patients. The Assessment Tool for Aseptic Technique [3] was implemented to evaluate the incidence of chorioamnionitis in birth encounters among laboring mothers during the period of the study.

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Materials and Methods: This DPI project used the quantitative, quasi experimental non-equivalent group posttest design to determine the impact of an aseptic technique training and assessment on the rate of maternal chorioamnionitis as compared to rates seen with standard procedures among laboring women admitted in a labor and delivery unit in a local hospital over 30 days. The comparison group was laboring women who were positive for chorioamnionitis established by the CMQCC [1] maternal data center before implementation of aseptic technique intervention. The DPI highlighted a need for adopting evidence-based practices to educate obstetric physicians, midwives, and nurses on aseptic technique measures. The National Healthcare Standards and Infection Prevention and Control Guidelines has provided the foundation for practical training sessions that are evidence-based [4]. The aseptic technique program by Lypson et al. [5], and the plan, do, study, act (PDSA) model by Taylor and colleagues [6] are essential tools for teaching physicians, midwives, and nurses about aseptic technique and potentially reduce the occurrence of chorioamnionitis among laboring women admitted in labor and delivery unit. Using a modified version of an assessment tool developed by Lypson et al. [5] all physicians, midwives, and nurses on the labor and delivery unit were prospectively trained to improve their practice habits. The training protocol was selected because of evidence that it could improve the knowledge of obstetric personnel on performance and reinforcement of their aseptic techniques. The clinical questions evaluated in this quantitative project included the impact of incorporating aseptic technique training of obstetric staff in a labor and delivery unit on the incidence of chorioamnionitis over a period of thirty days. The project applied a quasi-experimental design to two non-equivalent groups. Quasi-experimental designs have the ability of collecting data from two non-equivalent groups to enhance external validity and avoid ethical concerns [7, 8]. A convenience non-probability sampling method was employed [9, 10]. All laboring patients admitted at this local hospital that met the eligibility standards within the designated timeframe were included in the project. Women with potential safety risks such as those with immunocompromised systems, psychological impairments, and serious injuries were excluded.

Data was collected post-intervention over 30 days and compared and baseline data used approximately 100 unrelated participants from the facility's EHR over 3 months prior to the intervention. Aseptic training via HealthStream stimulated participation by the obstetric personnel based on the protocol currently used at this hospital. After the implementation of aseptic technique training, data was collected for comparison in this DPI project to evaluate if the rate of chorioamnionitis could be reduced by primary prevention. To show effects of caring for patients, Watson's caring theory [11] was delivered through training of obstetric physicians, midwives, and nurses. Incorporation of PDSA learning principles [6, 12] helped facilitate the training of labor and delivery healthcare providers.

2. Results and discussion

Table 1 Demographics of the Sample (N=856)

		N	%
Female Participants		856	100%
Age	<21	31	3.6%
	22-25	91	10.6%
	26-30	238	27.8%
	31-35	342	39.9%
	36-40	139	16.2%
	>40	15	1.8%
Delivery Method	Vaginal	627	73.2%
	Cesarean	229	26.8%
Ethnicity	Asian/Pacific Islander	348	40.6%
	Black/African American	79	9.22%
	Hispanic/Latino	268	31.3%
	Caucasian	4	.46%
	Others	17	2%
Language	English	763	89%

	Spanish	40	4.67%
	Chinese	19	2.2%
	Others	34	4%
Religion	Baptist	4	.5%
	Christian	131	15%
	Hinduism	70	8.2%
	Roman Catholic	215	25.1
	Orthodox Church	3	.3%

The demographic data of participants are displayed in Table 1. Most participants were English speaking (89%), Asian/Pacific Islanders (40.6%) (Table 2) and predominantly catholic (25.1%). There were more vaginal deliveries than Cesarean births (73.2% vs 26.8%) and those in the age group 31-35 had the more deliveries compared to those over 40 years ((39.9% vs 1.8%) (Table 1).

Table 1 the demographic information in percentages of the laboring women with chorioamnionitis prior to implementation of aseptic technique measures at this local hospital.

Table 2 shows the pre and post intervention rates of chorioamnionitis at the hospital according to the on ethnic groups in the sample.

Table 2 Women Positive for Chorioamnionitis Pre- and Post-Intervention by Ethnicity

Local Hospital Demographic	**Percent of women who were positive Pre-Intervention (n = 630)**	**Percent of Women who were positive Post—Intervention C-Section Delivery**	**Percent of Women who were positive Post—Intervention Vaginal Delivery**
Hispanic	7.8%	3.4%	12.3%
Non-Hispanic (White)	3.4%	3%	8.25%
Non-Hispanic (Black)	11.4%	2.4%	4%
Asian Pacific Islander	9.4%	6.1%	15.7%
Unknown	8.3%	< 1%	1%

The data on chorioamnionitis from the pre-intervention group compared to the post-intervention group using a chi-square analysis (Table 3) and revealed a statistically significant decrease in cases of chorioamnionitis was noted after the intervention (x^2 (N=856)=29.55, p=.001). The effect size reported as eta (η) was .407. After the implementation of aseptic technique in standard procedures for the months of August and September there was a significant difference in the number of women who tested positive for chorioamnionitis in September, post-intervention as compared to July, pre-intervention (Table 3).

Table 3 Chi-square of Groups and Cases of Chorioamnionitis

Group	**Chorioamnionitis**				
	Yes	**No**	**χ2**	**p**	**η**
Pre-Intervention Group	84	594	29.55**	.000	.407
Post-Intervention Group	23	155			

Note. * p<.05 is significant; **= p ≤ .01 is significant; n = eta (Effect size)

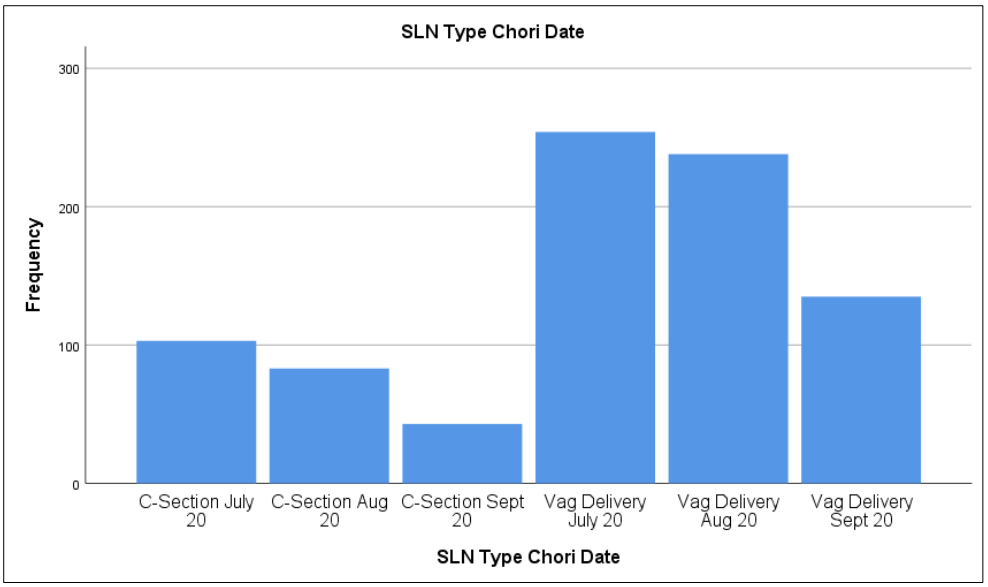

Figure 1 Incidence of chorioamnionitis post-intervention for C-Section and Vaginal Deliveries

Figure 1 revealed an overall trend toward lower rates of chorioamnionitis after the implementation of aseptic technique as compared to standard procedures for the months of August and September suggesting that reducing the rate of patients with chorioamnionitis during labor could improve patient's health outcomes. The implementation of aseptic technique at this local hospital reduced the number of women that screened positive for chorioamnionitis.

This DPI project provided a stimulus to integrate information sessions and training in aseptic technique measures to obstetric staff in an acute setting to improve the quality and value of care provided through the incorporation of evidence-based practices. The project ensured that obstetric staff had essential aseptic technique competencies, which reduced the gap of laboring women diagnosed with chorioamnionitis at the hospital to rates comparable to national rates, which in turn reduced morbidity and financial costs of this serious healthcare problem. The project also provided new knowledge on how to prevent chorioamnionitis based on Standards for Quality Improvement Reporting Excellence guidelines (SQUIRE) [13]. The DPI project offered the staff members the opportunity to become more engaged in their practice process as they participated in learning about improving overall health through maternal healthcare interventions and education program services presented during this period at this local hospital. Tabatabaei, Behmanesh, Pour, and Azadeh [14] pointed out essential gaps worth addressing in practice, including insufficiency in hospital infection control plans, unreliable scrutiny of healthcare-related infections, lack of antibiotic stewardship, insufficient written and displayed guidelines and policies, inadequate sterilization and cleansing of equipment, and inadequate hand hygiene. Providing training to healthcare workers was vital to improving infection control standards. Evidence-based approaches included protective clothing, barrier protections, and washing protocols to keep healthcare settings clean and to educate key obstetric staff on aseptic techniques in their practices [15]. The use of the aseptic technique approach limited and prevented pathogenic organisms from being introduced to susceptible sites through transmission or contact by hands, equipment, or infected surfaces. Aseptic techniques helped prevent infection when incorporated in standard hospital and community settings and were more sustainable than sterile techniques.

Additionally, the aseptic technique has been identified as being crucial for the inhibition of infection during labor epidural procedures. Therefore, a clear practiced procedure would influence a decline in infection occurrence with significant changes in aseptic practices perceived between non-teaching and teaching hospitals.

3. Conclusion

Aseptic technique was a necessary preventative measure used to perform invasive procedures including vaginal examinations. The vaginal area is an overly sensitive part of the female body. Vaginal infections can affect the mother and the baby. Extra precautions can limit potential for cross-contamination making the likelihood of contracting a disease exceptionally low. Providers recognize how necessary aseptic technique was for surgeries because extensive results and evidence-based practice have proven the substantial need for it. Thus, it was necessary to adapt and apply the same protocols to any practice involving instruments or digital vaginal examination. Therefore, recommendations were made to change the standard practice methods of managing care for laboring women by providing useful data to

support evidence-based practice techniques and teachings. A large sample study would yield important findings that would help policy and practice. The proposed results from this project would indicate that with incorporation of aseptic technique measures there would be a noticeable reduction of chorioamnionitis rates and there would be a tremendous support for implementation of aseptic technique measures to assist with infection control at this healthcare facility.

Compliance with ethical standards

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Disclosure of conflict of interest

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Statement of ethical approval

All potential ethical complications were addressed, and no persons or animals were harmed in this study. Consent was provided for all participants, patients, and staff.

References

[1] California Maternal Quality Care Collaborative (CMQCC) [Internet]. 2019. Available from URL https://www.cmqcc.org.

[2] Hofmeyr G. J., & Kiiza, J. A. Amnioinfusion for chorioamnionitis. *The Cochrane Database of Systematic Reviews*, 2016(8).

[3] ANMF Federal Education Team. Aseptic technique (ANTT) tutorial [Internet]. Australian Nursing and Midwifery Journal. 2019; 26(7): 24-26.

[4] Davidson, M. Teaching aseptic technique – Applying the basics. Infection, Disease & Health. 21(3), 139.

[5] Lypson, M. Buckler, S., & Poszywak, K. Aseptic technique [Internet]. MedEdPortal. 2015; 11: 10237.

[6] Taylor MJ, McNicholas C, Nicolay C, Darzi A, Bell D, Reed JE. Systematic review of the application of the plan-do-study-act method to improve quality in healthcare. BMJ Quality & Safety. 2014; 23(4): 290-298.

[7] Ingham-Broomfield, B. A nurses' guide to quantitative research. Australian Journal of Advanced Nursing. 2014; 32(2): 32-38.

[8] Borrego M, Douglas EP, Amelink CT. Quantitative, qualitative, and mixed research methods in engineering education. Journal of Engineering Education. 2009; 98(1):53-66.

[9] Elfil M, Negida A. Sampling methods in clinical research: An educational review. Emergency (Tehran, Iran). 2017; 5(1): e52.

[10] Martínez-Mesa J, González-Chica DA, Duquia RP, Bonamigo RR, Bastos JL. Sampling: how to select participants in my research study? Anais Brasileiros de Dermatologia. 2016; 91(3): 326–330.

[11] Watson J. Caring science and human caring theory: transforming personal and professional practices of nursing and health care. J Health Hum Serv Adm 2009 Spring; 31(4):466-82

[12] Laverentz DM, Kumm S. Concept evaluation using the PDSA cycle for continuous quality improvement. Nursing Education Perspectives, Wolters Kluwer Health. 2017; 38(5): 288-290.

[13] SQUIRE 2.0. Revised standards for quality improvement reporting excellence [Internet]. 2020 Available from URL http://squire-statement.org.

[14] Tabatabaei SM, Behmanesh Pour F, Azadeh H. Infection control practices and program management in labor and delivery units: A cross-sectional study from Iran, International Journal of Infection. 2016; 3(2): e32788.

[15] Stevens K. The impact of evidence-based practice in nursing and the next big ideas. OJIN: The Online Journal of Issues in Nursing. 2013; 18(2): Manuscript 4.