Puerperal sepsis and related factors at Al-Sadaqa teaching hospital, Aden Oct, 2015 – Mar, 2017

Entisar M. Abdulla, Huda A. Basorra and Nahla S. Al.kaaky

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Abstract

Puerperal sepsis is defined as the infection of the genital tract occurring at labor or within 42 days of the postpartum period. The puerperal sepsis/pyrexia presents commonly with fever and other symptoms like pelvic pain, foul smelling vaginal discharge and delayed reduction of the uterine size. This infection may originate at the placental site or within lacerations of the cervix, vagina, or perineum.

Since puerperal sepsis is a preventable factor of maternal morbidity and mortality, the objectives of this study are to identify risk factors and to evaluate maternal morbidity and mortality from sepsis in Al-Sadaka Teaching Hospital.

This study employed a descriptive, retrospective observational study design,evaluated10718 women of them 45 women going through puerperal sepsis, over a period of 18 months, presenting with symptoms and signs of puerperal sepsis/pyrexia.

The demographic data showed that women aged 20-34 years (66.7%) were the most affected with a full term pregnancies (85%). Most (57.8%) of the respondents were of low parity level. The obstetric data showed that most (62.2%) of the respondents were delivered at hospital, 91.1% had spontaneous deliveries, and 60% of the deliveries attends by medical personnel. Anaemia was the main risk factor detected in all of the patients. Three quarters of the respondents develops the disease within the first 12 postnatal days, most frequent presenting complains were secondary PPH (17.8%), fever with foul-smell vaginal discharge (15.6%), sole presence of fever (11.1%), septicemia (8.9%) and Fever & abdominal pain (6.7%). Other morbidities associated with puerperal sepsis were found less frequently. Regarding the ultra-sound findings, signs of endometritis were present in more than three quarters of the case (80%).

Monitoring of infection rates should become a priority in all maternity units and may be a preventive intervention in itself. The introduction of postpartum uterine scanning, especially for women with risk factors for puerperal complications, all need to be considered in order to improve the quality and safety of health facility care in our country.

Key wards: Puerperal sepsis, maternal mortality, fever, foul smelling vaginal discharge.

Introduction:

Every pregnancy is a unique experience for a woman; an experience which may be complicated at any stage. (10)

The postpartum period or puerperium, (Latin word puer means ‘child’ and pareremeans“to bring forth”), refers to the 6 weeks after child birth. Puerperal sepsis is an infection which arises from bacterial invasion of the genital organs during puerperial period (4). Now a days, puerperal sepsis is a big problem, due to its prevalence and morbidity (6). According to World Health Organization (WHO), 75,000 maternal deaths occur worldwide per year. (37)

According to the (WHO), puerperal sepsis is defined as the infection of the genital tract occurring at labor or within 42 days of the postpartum period. The puerperal sepsis/pyrexia presents commonly with fever and other symptoms like pelvic pain, foul smelling vaginal discharge and delayed reduction of the uterine size (36). This infection may originate at the placental site or within lacerations of the cervix, vagina, or perineum. The genital tract may be involved alone or there may be spread to other sites. It is important to remember that pyrexia in the puerperium may also arise from infections of the breast, urinary tract, lungs, or any of a number of other medical or surgical conditions, including malaria and typhoid. (18)

The first recorded epidemic of puerperal fever occurred at the Hotel-Dieude Paris in 1646. Hospitals throughout Europe and America consistently reported death rates of 20% to 25%. During 18th and 19th centuries, it was the single most common cause of maternal mortality, accounting for about half of all deaths related to child birth and second only to tuberculosis in killing women of child bearing age. [22]

Around the world, it is fraught with difficulty because the etiology and epidemiology of sepsis vary enormously as a result of local conditions in particular with regard to hygiene during delivery and rates of reproductive tract infections [1]. It ranges from 1% to as high as 17% [12]. In the USA puerperal infection occurs in between 1-8% of all deliveries and about 3 die from puerperal sepsis/100,000 deliveries [7]. In the UK the number of direct maternal deaths from 1985–2005 due to genital tract sepsis/100,000 maternities was 0.4–0.85 [20]. Global incidence was reported to be 4.4% of live births. [1]

In Yemen, like other developing countries, Puerperal sepsis is still a leading cause of maternal death with maternal mortality due to infections being as high as 17.65%, documented in the period from 2004-2006. [5]

Since puerperal sepsis is a preventable factor of maternal morbidity and mortality, the objectives of this study are to identify the risk factors and to evaluate maternal morbidity and mortality from sepsis in Al-Sadaka Teaching Hospital.

Materials and Methods

This study was conducted retrospectively at Al-Sadaka Teaching Hospital over a period of 18 months, from 1st October 2015 to 31th March 2017.

All women admitted to Obstetrics and Gynecology Department, within 42 days of delivery with genital tract sepsis, fulfilling the criteria proposed by the World Health Organization (WHO) for definition of puerperal sepsis, were included in the study.

Patient's general and obstetric profiles were recorded on preformed questioners. Ultrasonography was noted to know retained products of conception (RPOC), if any, or development of endometritis, endomyometritis, peritonitis, uterine subinvolution and infected uterine hematoma.

Data was analyzed using Statistical Package for Social science (SPSS) version 21. Descriptive statistics such as percentages and frequencies were used to describe proportions for the occurrence of puerperal sepsis. Descriptive data were presented in tables and graphs.

Observations and Results

A total of 10,718 parturient were admitted over the period of 18 months from 1st October 2015 to 31st March 2017. There were 45 post natal patients having puerperal sepsis (WHO definition) were included in the study. The frequency of puerperal sepsis was 0.42%.

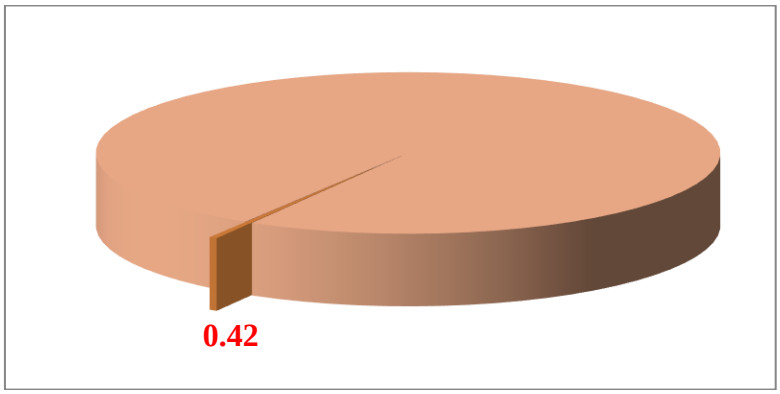

Figure no. 1: Frequency of puerperal sepsis in Al-Sadaka Teaching Hospital from 1st October 2015 to 31st March 2017

Table (1): The socio-demographic profile of the patients (45 cases)

VARIABLES	Puerperal Sepsis	
	No.	%
Maternal age		
< 20 years	**5**	**11.1**
20 – 34 years	**30**	**66.7**
≥ 35 years	**10**	**22.2**
Gestational age		
< 37 weeks	**5**	**11.1**
37 – 42 weeks	**38**	**84.5**
> 42 weeks	**2**	**4.4**
Parity		
Nullipara	**-**	**-**
Pluripara (1-3 children)	**26**	**57.8**
Multipara (4-5 children)	**9**	**20.0**
Grand mulipara (≥ 6 children)	**10**	**22.2**

Results in this study showed that the age of respondents range from 20 to 34 years in 66.7% of the cases. Majority (84.5%) of the participants delivered a full term babies with Gestational age ranging from completed 37 weeks and 42 weeks.

Results also showed that mothers with two to three children had increased the risk of getting puerperal sepsis (57.8%). However, subsequent more deliveries decreased the risk of the disease (42.2%).

Table (2): Obstetrical profile of the patients

VARIABLE	Puerperal Sepsis	
	No.	%
Place of Delivery		
Home	**15**	**33.4**
Hospital	**28**	**62.2**
Private clinics	**2**	**4.4**
Mode of delivery		
Vaginal	**41**	**91.1**
Cesarean Section	**4**	**8.9**
Birth Attendant		
Family member	**10**	**22.2**
Traditional birth Attendant	**8**	**17.8**
Midwife	**16**	**35.6**
Doctor	**11**	**24.4**
State of membrane		
Intact	**31**	**68.9**
Rupture membrane		
1. More than 24 hr	**6**	**13.3**
2. More than 36 hr	**8**	**17.8**
Delivery to admission Interval		
< 12 day	**34**	**75.6**
12- <24 days	**7**	**15.5**
24 - 42 days	**4**	**8.9**
Maternal hemoglobin level		
< 5 gram	**21**	**46.7**
5-7 gram	**10**	**22.2**
7-9 gram	**14**	**31.1**

Among the women who had delivered and had the disease, 28 (62.2%) of the respondents were found to have had deliveries in the hospitals, while 33.4% (15) of respondents had delivered at home. Only two cases (4.4%) delivered in Private clinics developing puerperal sepsis.

Among the women with puerperal sepsis assessed, high proportion of respondents (91.1%) had delivered through spontaneous vaginal delivery. This was compared to only 8.9% who had Caesarian-section delivery

The Birth Attendants were Midwives (35.6%) and Doctors (24.4%), i.e., health care providers; while in the remaining patients the attendance were Family members (22.2%) and Traditional birth Attendants (17.8).

It was also found that majority of women (68.9%) who had delivered did not experience membrane rapture; while 13.3% had waited for their membrane rapture that lasted for 24 hours or more, (17.8%) had a waited for 36 hours or more.

Time interval from delivery to presentation was less than 12 days in 75.6% of the respondents. In 8.9% it takes longer time for the symptoms to occur (24-42 days).

All the cases with varying degrees of anemia, with approximately half of them (46.7%) had hemoglobin level less than 5 gram.

Table (3): Morbidity and Mortality from sepsis

VARIABLE	Puerperal Sepsis	
	No.	%
Presenting symptom		
Fever alone	**5**	**11.1**
Foul smell vaginal discharge alone	**3**	**6.7**
Secondary PPH	**8**	**17.8**
Abdominal pain or distension	**2**	**4.4**
Diarrhea	**2**	**4.4**
Dizziness and headache	**1**	**2.2**
Septicemia	**4**	**8.9**
Fever & foul-smell vaginal discharge	**7**	**15.6**
Fever & PPH	**2**	**4.4**
Abdominal pain & PPH	**2**	**4.4**
Headache & PPH	**1**	**2.2**
Fever & abdominal pain	**3**	**6.7**
Fever & cesarean wound infection	**1**	**2.2**
Fever & jaundice	**1**	**2.2**
Swelling in vulva	**1**	**2.2**
Infected perineal tear	**2**	**4.4**
Ultra-Sound findings		
Endometritis	**36**	**80.0**
Endomyometritis	**2**	**4.4**
Perimetritis	**2**	**4.4**
Subinvolution	**1**	**2.2**
Infected abdominal heamatoma	**1**	**2.2**
No pathology	**3**	**6.7**
Complications		
Renal failure	**1**	**2.2**
Congestive cardiac failure	**1**	**2.2**
Maternal mortality	**1**	**2.2**
PPH: Post Partum Hemorrhage		

Table 3 shows the distribution of morbidities experience by the respondents, ultra-sound findings, and complications. Results showed that most frequent presenting complains were secondary PPH (17.8%), fever foul-smell vaginal discharge (15.6%), soul presence of fever (11.1%), septicemia (8.9%) and Fever & abdominal pain (6.7%). Other morbidities associated with puerperal sepsis were found to occur in small percentages of the study population.
Regarding the ultra-sound findings, signs of endometritis were present in more than three quarters of the cases (80%). No pathology was present in 6.7%.
Renal failure, Congestive cardiac failure and Maternal mortality occur similarly in 2.2% of each.

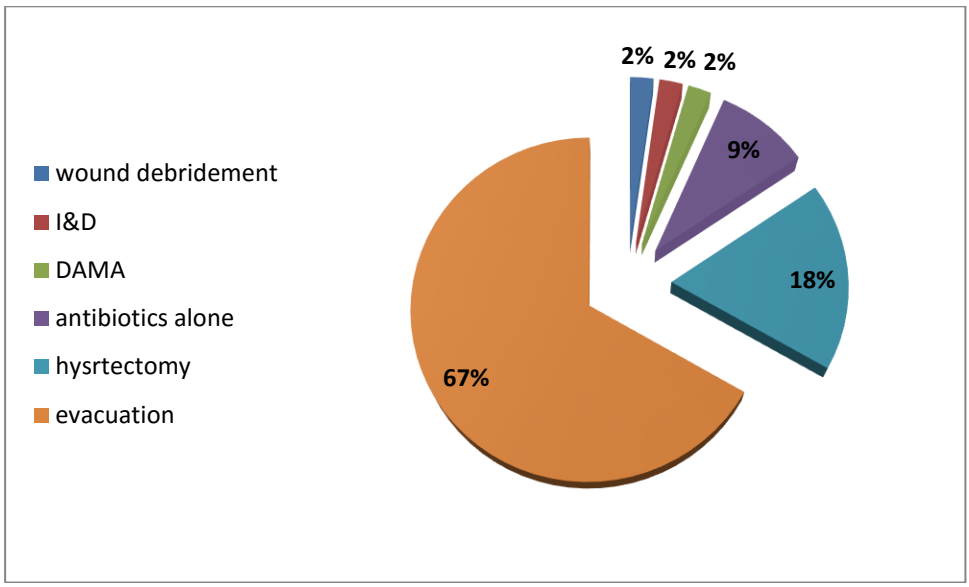

Figure no. 2: Management strategies taken in the treatment of the puerperal sepsis cases.

It is clear from this figure that must of puerperal sepsis were managed by evacuation (67%), while hysterectomy was done for 18% of the cases, and antibiotics alone treated about 9% of the cases, were recorded 2% for each one of Discharge Against Medical Advice (DAMA), Incision and Drainage (I&D) and wound debridement.

Discussion:

Puerperal infection is still a significant cause of morbidity and mortality among women in the developing countries [(2)]. It is one of the leading causes of maternal mortality worldwide and the second most common cause of maternal death after postpartum haemorrhage in Asia and Africa, accounting for as much as 15% of deaths [(17)], and with maternal morbidity being 8.1% [(13)]. Other obstetric puerperal infections, such as genital tract infections, wound infections and urinary tract infections following delivery may be less devastating but are nevertheless responsible for ill health and slow recovery of the mother in the postpartum period and directly associated with early onset neonatal sepsis and can also affect newborn wellbeing indirectly, causing difficulties for example in breastfeeding and by interfering with mother and child bonding. [(16)]
From our study we found out that the incidence of puerperal sepsis was 0.42%. It was evident from the results that most mothers, who developed puerperal sepsis, were aged 20-34 (66.7%) and of low parity (pluripara) (57.8%). Our results were similar to many studies and attributed this to be resulted from the fact that young inexperienced mothers tend to seek services of traditional birth attendants. They mostly deliver outside health facility due to lack of knowledge regarding health care, antenatal visits and delivery in adequately equipped medical facilities, they also have poor child spacing tendency and with the coming of the second child (poorly spaced) they are

overwhelmed with duties hence forgetting about their health [2,8,27,32,34]. It is reasonable to expect such finding occurred in old women due to the increase in several pregnancy complications including maternal sepsis [19,35]. Regarding the gestational age, we noticed that most of the patients (84.5%) delivered full term babies.

While investigating places of delivery and the birth attendants among the respondents, strikingly, this study found out that the majority (62.2%) had delivered in the hospitals, and by health care providers (60%). Similar results was obtained also by Chepchirchir[8]. Previous studies, however, found that most of the study participant had delivered at home [16,32]. This study also revealed that the mode of delivery of most respondents (91.1%) was through the vaginal route which may be interpreted as that the infection is principally the consequence poor hygiene. Chepchirchir (8) also reached to the same results [8]. Sepsis following Cesarean Section encountered in 8.9%. Olsen et al. (26) study the risk factors for endometritis following low transverse cesarean section and found the risk of endometritis was independently associated with younger age and anemia, and was marginally associated with lack of private health insurance, and amniotomy, they identified it in 7.7% women within 30 days after the operation [26].

Contrary to the above finding, a research on the similar subject while conducting a study in U.S.A, it was concluded that about 3 women die from puerperal sepsis for every 100, 000 deliveries and that, the single most important risk factor being caesarean section not aseptic condition [21]. In a similar development Yokoe (38) in his study opined that the rate of puerperal sepsis is higher in women who have undergone caesarean section (7.4%) than in women who had vaginal delivery (5.5%). [38]

Prolonged state of an open cervix with ruptured membranes during labors, allows infections to ascend from the vagina [25], contrary to this, we found as 68.9% of the cases had intact membranes. In a related studies, Dare et al. (9) and Momoh et al. (24) reported in their research that premature rupture of membrane and non adherence to aseptic conditions during delivery was the commonest predisposing factor to puerperal sepsis, they gave an estimate of 85.7%, from this correlation one can be truly sure that aseptic condition is a key factor in prevent puerperal sepsis. [9,24]

Anemia was found in all the cases with varying degrees, with approximately half of them (46.7%) had hemoglobin level less than 5 gram.

Contrary to our results, Madhudas, et al. (22) and Tajinder et al. (33) conclude from their studies that the predisposing factors leading to the development of sepsis include: home birth in unhygienic conditions, primiparity, anemia, prolonged rupture of membranes, multiple PV examinations, caesarean section and obstetrical maneuvers [22,33]. This is contradicts to our findings, as we found that sepsis occur more frequently in cases delivered in the hospital, pluriparae, with intact membranes and in those delivered vaginally; we agreed with them in that anaemia was a main risk factor.

The time interval from delivery to presentation of our respondents was less than 12 days in 75.6%. International Classification of diseases (ICD-10) defined puerperal pyrexia as a "temperature rise above 38.0 degree Celsius maintained over 24 hours from the end of the first day till the end of the tenth day after childbirth or abortion (excluding the first 24 hours)" [11]. The most common presentations was fever with secondary PPH, with foul-smell vaginal discharge, with abdominal pain, or fever only and Septicemia presented in 8.9% of the cases. Most of the patients had more than one symptom. In addition we found out, less frequently, other types of puerperal infections such as wound infections, diarrhea and jaundice. Puerperal sepsis related mortality was 2.2% in our study. As revealed by the US, 80 % had pelvic infection limited to uterine cavity i.e. endometritis. While 4.4% had endomyometritis.

Of all the components of maternal healthcare delivery, postnatal and early newborn care is the fields demanding heightened vigilance [30]. From our study and the review of literature, we conclude that correction of maternal anemia, better aseptic conditions, restrict pelvic examinations, recognition of all the high risk cases and prophylactic administration of antibiotic can go a long way in preventing puerperal sepsis. Most puerperal sepsis take place after hospital discharge, in

the absence of postnatal follow-up. Hospital delivery on its own might not be very effective against puerperal sepsis, and such infection is nosocomial; one can contract it in the health facility as a result of poor antiseptic practices.

The current literature describes 2 main techniques for puerperal sepsis prevention. The first, hand hygiene, is the most important component of infection control, and can be achieved by standard hand washing with soap and water, or a hand-cleansing agent that obviates the need for water and for hand drying. This hand rub, containing alcohol and antiseptics, has been studied for use in developed countries and found to be microbiologically effective with few side effects [(14,28)]. The second technique, intra vaginal application of antiseptics such as chlorhexidine and iodine, has also been proposed for routine use before labor or cesarean delivery to reduce maternal and neonatal postpartum infections [(36)]. However, the efficacy of vaginal preparation with antiseptics is not universally accepted. [(31)]

The principles of management in cases of puerperal infection include assessment of risk factors, a detailed history, a "head-to-toe" examination, appropriate laboratory and radiologic tests, and treatment of the cause. [(23)]

Current recommendations for infection control involve the implementation of multiple approaches in health facilities, including the use of guidelines, protocols, education, training, feedback, surveillance and organisational change [(3,15,29)]. Such multimodal strategies have also been highlighted by the World Health Organization's Global Patient Safety Challenge [(29)]. Reducing infection by improving for example, team working, the functionality of infection control committees, changes in behaviors or practice (e.g. hand washing) and reducing unnecessary interventions (e.g. overuse of caesarean section or antibiotics).

Monitoring of infection rates should become a priority in all maternity units and may be a preventive intervention in itself. research considerations in this part, accurately diagnosing different types of puerperal infections are needed alongside development of microbiological diagnostic capacity, and establishment of postnatal care and the introduction of postpartum uterine scanning, especially for women with risk factors for puerperal complications, all need to be considered in order to improve the quality and safety of health facility care in our country.

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الإنتان النفاسي والعوامل المتعلقة به في مستشفى الصداقة التعليمي– عدن أكتوبر 2015 - مارس 2017م

انتصار محمد عبدالله، هدى عبود باصرة ونهلة صالح الكعكي

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المخلص

يعرف الإنتان النفاسي بأنَّه عدوى الجهاز التناسلي التي تحدث في المخاض أو في غضون 42 يوما من فترة ما بعد الولادة. يشمل الإنتان النفاسي/ الحمى عادة الحمى وأعراض أخرى مثل آلام الحوض، رائحة كريهة للإفرازات المهبلية وتأخر رجوع حجم الرحم. قد تنشأ هذه العدوى في موقع المشيمة أو داخل تمزق عنق الرحم، المهبل، أو العجان.

وبما أنّ الإنتان النفاسي هو أحد العوامل التي يمكن الوقاية منها لأمراض ووفيات الأمهات، فإنّ أهداف هذه الدراسة هي تحديد عوامل الخطر وتقييم معدلات الاعتلال والوفيات أثناء فترة النفاس الناجمة عن الإنتان, في مستشفى الصداقة التعليمي.

استُخدمت هذه الدراسة وصفاً لتقييم 45 امرأة أصيبت بالإنتان, من أصل 10718 امرأة، على مدى فترة 18 شهراً، مع ظهور أعراض وعلامات الإنتان النفاسي/ الحمى.

وأظهرت البيانات الديموغرافية أنَّ النساء اللائي تتراوح أعمارهن بين 20 و 34 سنة (66.7 في المائة) هن الأكثر تضررا.85% أحمال كاملة النمو. وكان معظم (57.8٪) من المرضى ذو مستوى منخفض للإنجاب. وأظهرت البيانات التوليدية أنَّ معظم (62.2٪) من المستطلعات تم ولادتهم في المستشفى، 91.1٪ لديهم ولادات طبيعية تلقائية، و 60٪ من الولادات تحت إشراف العاملين في المجال الطبي. وكان فقر الدم هو عامل الخطر الرئيسي المكتشف في جميع المرضى. ثلاثة أرباع المستطلعات ظهرن المرض خلال ال 12 يوما الأولى بعد الولادة، وكانت الشكاوي الأكثر شيوعاً هي النزف الثانوي بعد الولادة (17.8٪)، والحمى المصاحبة بإفرازات مهبلية الكريهة (15.6٪)، والحمى فقط (11.1٪)، إنتان الدم (8.9 ٪) والحمى وآلام البطن (6.7٪). ووجدت حالات قليلة مصاحبة أعراض أخرى. فيما يتعلق بنتائج جهاز الموجات فوق الصوتية، كانت علامات التهاب بطانة الرحم موجودة في أكثر من ثلاثة أرباع هذه الحالة (80٪).

ينبغي أن يصبح رصد معدلات الإصابة أولوية في جميع وحدات الأمومة قد يكون تدخلا وقائيا في حد ذاته. إنشاء الرعاية بعد الولادة وإدخال المسح بجهاز الموجات فوق الصوتية بعد الولادة، وسيما بالنسبة للنساء ذو عوامل خطيرة للإصابة بمضاعفات فترة النفاس، وذلك من أجل تحسين جودة وسلامة الرعاية الصحية للمرافق الصحية في بلدنا.

الكلمات المفتاحية: الإنتان النفاسي, وفيات الأمهات, الحمى, رائحة كريهة للإفرازات المهبلية.