

4. Management of Puerperal Sepsis

Contributed by

Dr .D.Y.K.De Silva
 Dr. Athula Fernando
 Dr. V.P. Gange
 Dr. S.B. Uduwerella
 Dr. C. Rathnayake
 Dr. Gayan De Silva
 Dr. W. Ruwan Pathiraja

Management of Puerperal Sepsis

Contents	Page
4.1 Scope of the Guideline	65
4.1.1 Definition of puerperal sepsis	65
4.1.2 Definition of puerperal infections	65
4.1.3 Significance	66
4.2 Prevention	67
4.2.1 Antenatal period	67
4.2.2 Refer for specialist care those at risk	67
4.2.3 Intrapartum period	67
4.3 Management	69
4.3.1 Communication & Transport	69
4.3.2 Resuscitation	70
4.3.3 Monitoring	71
4.3.4 Treatment	72
4.3.5 Surgical interventions	76
4.4 References	78
4.5 Further reading	78

Introduction

This guideline is to provide recommendations to aid General Practitioners and Obstetricians in the management of **Puerperal Sepsis**. This treatment could be initiated in a primary care setting or in centres with advanced facilities. The objective of management in puerperal sepsis is to make an early diagnosis, treat, prevent complications, and consequently to improve quality of life.

4.1 Scope of the guideline

To prevent maternal deaths and long-term morbidity by early identification and management of puerperal sepsis.

4.1.1 Definition of puerperal sepsis

Puerperal sepsis was defined as infection of the genital tract occurring at any time between the onset of rupture of membranes or labour, and the 42nd day postpartum in which two or more of the following are present:

- Pelvic pain,
- Fever i.e. oral temperature 38.5°C/101.3°F or higher on any occasion,
- Abnormal vaginal discharge, e.g. presence of pus,
- Abnormal smell/foul odour of discharge,
- Delay in the rate of reduction of the size of the uterus (involution) (<2 cm/day during first 8 days).

4.1.2 Definition of puerperal infections

Puerperal infections is a more general term than puerperal sepsis and includes not only infections due to puerperal sepsis, but also all extra-genital infections and incidental infections:

- Infections of the genito-urinary systems related to labour, delivery and the puerperium,
- Infections related to the uterus and its associated structures,
- Infections related to the urinary tract,
- Infections specifically related to the birth process but not of the genito-urinary systems, e.g.
 - breast abscess,
 - incidental infections, e.g. malaria, respiratory tract infections,

It is advisable to consider these possibilities at the time of diagnosis.

4.1.□ Significance

- Puerperal infections are an important cause of morbidity and mortality for mothers in developing countries. **It is one of the commonest causes of maternal deaths in Sri Lanka⁹.**
- The infected mother in acute stage, suffers severe pain and is acutely ill very often ending in death.
- Often the recovery eventually result in infertility, chronic debilitation and life long suffering.

4.2 Prevention¹

4.2.1 Antenatal period

Antenatal care helps to reduce puerperal infections by:

- Diagnosis and treatment of urinary tract infections.
- Diagnosis and treatment of anaemia and malnutrition.
- Diagnosis and treatment of diabetes mellitus.
- Assessment of risk factors for fetopelvic disproportion.
- Diagnosis and treatment of pre-existing sexually transmitted infections e.g. Gonorrhoea, Chlamydia etc.,
- Diagnosis and treatment of other vaginal infections.
- Identification and appropriate management of prolonged rupture of membranes (>12hours)^{1,5}

(Grade X)

4.2.2 Refer for specialist care those at risk

- Previous prolonged labour.
- History of repeated abortions.

4.2.□ Intrapartum period

(Grade X)

- Strict adherence to established antiseptic and sterilisation procedures such as, **(Grade X)**
 - Cleaning hands immediately prior to delivery,
 - Cleaning perineum,
 - Cleaning delivery surface,
 - Sterilised surgical instruments,
 - Clean cord tie and clean cord care,
 - Use of a prepacked sterilised delivery kits.
- Institutionalizing all deliveries. **(Grade X)**
- Restricting vaginal examinations to minimum in premature and prolonged rupture of membranes (PPROM). Refer guideline on Preterm Rupture of Membranes **(Grade X)**

- Prevention of prolonged labour by maintaining the partogram in all patients who are in labour and intervention at the action line and early maternal transfer when indicated. **(Grade X)**
- Strict adherence to sterile procedures at every vaginal examination in women in labour.
- Strict adherence to sterile procedures especially when performing an emergency Caesarean Section and/or any other operative procedures such as, removal of retained placenta or retained products of conception. **(Grade X)**
- Ensuring sterility in the operating room. **(Grade X)**
- Ensuring sterility in the labour room. **(Grade X)**
- Encourage-voiding urine during labour thereby avoiding unnecessary catheterization.
- Avoid unnecessary episiotomy.

- Use soap, water and effective antiseptics (e.g. chlorhexidine, surgical spirit (see -Annex 2) to clean hands, wear gloves on both hands for vaginal examination, delivery and handling of infants.^{1, 2, 3, 4} **(Grade X)**
- Use correct methods for sterilization (e.g. 0.5% chlorine solution), proper disinfection techniques (e.g. boiling for 20 minutes) and sterilization (dry, heat or steam) of instruments and equipment. **(Grade X)**
- Maintain sufficient supply of antibiotics. Consider prophylactic use of antibiotics for invasive procedures, manual removal of placentae, internal version, and third degree perineal tears. **(Grade X)**

4. Management

Components of management:

- 4.1 Communication & Transport
- 4.2 Resuscitation
- 4.3 Monitoring
- 4.4 Documentation
- 4.5 Treatment

4.1 Communication & Transport

4.1.1 Non-Specialist Unit

- In patients where severe sepsis is diagnosed or suspected initial resuscitative and antibiotic therapy should be commenced as an initial step and such patients should be transferred to a specialist unit without delay.

(Grade X)

The specialist unit receiving the patient should be fore-warned regarding the condition, the blood group (if available) and medicines given to the patient.

- Medical, senior nursing and midwifery staff should be members of the team caring for such patients.
- Establish good intravenous access. **(Grade X)**
- Institute intravenous antibiotics (ampicillin, metronidazole, gentamicin, etc. (Refer dosage-non specialist unit treatment –page 76)

4.1.2 Specialist Unit

- Call Senior Midwifery/Nursing staff
- Alert Obstetrician
- Alert medical staff
- Alert Anaesthesiologist

The services of ward employees should be summoned in appropriate cases. This would facilitate transport and handling of specimens and patients with minimum delay.

4.2 Resuscitation

Patients in septic shock or having evidence of severe sepsis, resuscitative procedures should be instituted **with out any delay**. This is life saving. **(Grade X)**

4.2.1 Non-Specialist unit

While preparations are being made in patients who are having severe sepsis to be transferred to a specialist unit the following steps are recommended prior to transfer.

- Establish good intravenous (IV) access (14 G cannula),
- Therapy with intravenous (IV) antibiotics,
- Commence intravenous infusions while waiting,
 - Infuse alternatively as rapidly as required the following;
 - Crystalloids e.g. Hartman's and normal saline solutions (maximum 2 liters),
 - Colloids if available (Hitastarch, Gelatin or Haemacil), **(Grade Y)**
- Oxygen by mask at 8 liters/min.

Dextrans are hazardous and should not be used in obstetric practice. **(Grade X)**

4.2.2 Specialist Unit

- Good intravenous (IV) access,
- Blood for cross match,
- Oxygen via face-mask,
- Transfusion of blood/ fresh frozen plasma (FFP) depending on need,

- Intravenous (IV) antibiotics (broad spectrum), discuss with microbiologist.

4.1.1 Monitoring and investigations

4.1.1.1 Non Specialist Unit

- Good Intravenous (IV) access,
- Blood for; (20 ml)
 - Full blood count (FBC),
 - Bleeding time (BT),
 - Clotting time (CT),
 - Culture and antibiotic sensitivity (if facilities available),
- Urine full report (UFR),
- Sterile sample of urine for culture and antibiotic sensitivity,
- Indwelling catheter for monitoring hourly urine output,
- Blood pressure (BP) and pulse measurement every 15 minutes.

4.1.1.2 Specialist Unit

- Intensive care unit (ICU); Care in collaboration with anaesthesiologist is mandatory in severe sepsis/shock. **(Grade X)**
- Good intravenous (IV) access,
- Blood for; (20 ml)
 - Full blood count (FBC),
 - Blood urea (BU),
 - Serum electrolytes (SE),
 - Liver function tests (LFT),
 - Blood for culture and antibiotic sensitivity,
 - Clotting profile.

- Genital swabs
 - Perineal, vaginal, high vaginal, endocervical swabs for culture and antibiotic sensitivity,
- Ultrasound scan (USS) of pelvis,
- X-ray chest/abdomen (to detect perforations),
- Regular pulse and blood pressure recording (every 15mins),
- Foley catheter to monitor hourly urine output,
- Central venous pressure (CVP) monitoring (where appropriate and when experienced staff is available),
- Dedicated intensive care nurse per patient should be arranged whenever possible.

4.1.4 Treatment

If detected by family health worker (FHW) at home visit

If the woman is very sick (high fever, altered consciousness, rapid pulse) give her ampicillin 3 gms. orally and send her to the closest specialist hospital immediately. **(Grade X)**

All women with evidence of sepsis including infected episiotomies should be sent to the hospital preferably to the closest specialist unit. **(Grade X)**

No woman should be managed by the FHW at home. **(Grade X)**

However, in the exceptional situation where there is a delay in getting to the hospital ampicillin or amoxycillin 3 gms. may be given while awaiting admission.

4.4.1 Non-specialist hospital

If managed at non-specialist level, the patient should be reviewed twice a day by the DMO/MO. **(Grade X)**

- Look out for signs of shock, septicaemia, pallor, anaemia, and treat accordingly.
- Perform an abdominal examination and assess uterine size.
- Assess uterine haemorrhage and attempt to control it. Failure to control uterine bleeding is an indication to transfer to a specialist unit.
- Start antibiotics after taking samples for microbiology.
 - Amoxycillin- clavulanic acid – 1.2 gms. intravenous 8 hourly or 625mg. oral 8 hourly/twice a day,
 - Or
 - Ampicillin 500mg. intravenous 6 hourly,
 - Or
 - Amoxycillin 500mg. intravenous 8 hourly,
 - Or
 - Gentamicin 5mg./kg body weight/day in a single dose or in two divided doses.
- **Giving penicillin with gentamicin and metronidazole provides the broadest coverage.**
- **Give IV fluids: 1 litre of 5% dextrose in saline or normal saline rapidly, followed by 1000 cc every 24 hours.**
- **Check vital signs and urinary output every 6 hours.**
- Reassess every 24 hours: if there is no improvement refer her to a specialist hospital.
- If there is improvement, continue intravenous (IV) antibiotics for 3 days and then follow-up with oral antibiotics.
- **At this point, if the woman is much better, send her home on oral antibiotics for 4-7 days, after having**

checked her haemoglobin level and given her treatment for anaemia if found.

Even if the woman improves initially and subsequently start to bleed, she should be referred to a specialist unit to exclude retained products of conception.

- **If the area is malarious, treat her according to the local situation and national policy.**
- Inform her to return if she develops fever, vaginal bleeding or abdominal pain.
- If the woman is not better after three days on intravenous antibiotics, refer her to the first referral level.

Special circumstances for transfer to a specialist hospital

- i. Condition of the patient
 - If initial assessment indicate moribund state, septicaemia, repeated body temperatures above 101°F, hypotension,
 - Tender abdomen/abdominal mass, purulent vaginal discharge,
 - Patient not responding to initial treatment and condition getting worse.
- ii. If above-mentioned resuscitative and therapeutic facilities not being available.

4.4.2 Specialist hospital

- Perform a physical examination to rule out pelvic abscesses, pelvic thrombophlebitis, anaemia etc., **(Grade X)**
- Take vaginal swabs for gram stain and culture and antibiotic sensitivity test and blood for culture and antibiotic sensitivity test. **(Grade X)**

•Broad-spectrum antibiotic coverage must be initiated immediately after collection of cultures. Group A Streptococcus is exquisitely sensitive to β -lactams.

(Grade X)

- Amoxicillin- clavulanic acid (Amoxycrav) – 1.2 gms. intravenous 8 hourly with or without gentamycin.

If response is poor,

- Imipenem 500 mg. intravenous 8 hourly
Or
- Ticarcillin-clavulanic acid 3.2 gms. intravenous 8 hourly may be used in place of amoxicillin-clavulanic acid (Amoxycrav). Depending on culture and ABST results changes may be needed.

Antibiotics taken together are effective against a wide range of bacteria, but may not be capable of clearing up the infection completely, especially if an abscess or blood clot is present.

•Manage complications appropriately, **(Grade X)**

- 1.Retained placental fragments,
- 2.Presence of blood clots,
- 3.Pelvic abscess;

If the infection is complicated by the presence of an infected focus, it may be necessary to surgically drain the infected site/abscess. Continuing adequate and effective antibiotic therapy in this situation is mandatory. **(Grade X)**

4.Thrombophlebitis;⁸

If thrombophlebitis occurs in a superficial vein, self-care steps that include applying heat to the painful area, elevating the affected leg and using a non-steroidal anti-inflammatory drug may be recommended. The condition usually subsides within a week or two. **(Grade X)**

In the presence of deep vein thrombosis use of anticoagulants, such as heparin, will prevent clots from growing. After the heparin therapy, use of warfarin (Coumarin) for several months continues to prevent clots from growing.

Support stockings- these help prevent recurrent swelling and reduces the chances of complications of deep vein thrombosis.

5.Anaemia;

- If haemoglobin level is <8mg./dl. – blood transfusion is recommended.
- If haemoglobin level is 8-10 mg./dl. – oral or parenteral haematinics are recommended.

4.□.5 Surgical interventions

- Infected episiotomies can be opened and allowed to drain. Abscesses and blood clots may require surgery.
- When multi-disciplinary approach is indicated the services of a surgeon, haematologist, pathologist and microbiologist may be of paramount importance.
- Clot removal or by-pass. Sometimes, surgery is necessary to remove an acute clot blocking a pelvic vein or an abdominal vein. Procedures such as bypass/stent/filter may be necessary.
- Prompt and aggressive exploration and debridement of necrotic tissue are important. Hysterectomy is usually not needed; however, in severe cases involving large bacterial inocula, extensive tissue necrosis, or gangrene, hysterectomy and even removal of adenaxal tissue might be indicated.

- Consider other coexisting conditions urinary tract infections (UTI), mastitis, deep vein thrombosis (DVT), respiratory tract infections (RTI), malaria etc.

4.4 References

1. International Journal of Gynecology and Obstetrics 85 Suppl. 1 (2004) S52–S61 Puerperal sepsis and maternal mortality: what role can new technologies play? J. Husseina, *, J.A. Fortneyb
2. Hugonnet S, Pittet D. Hand hygiene revisited: lessons from the past and present. *Curr Infect Dis Rep* 2000;2(6):484–489.
3. Widmer AF. Replace hand washing with use of a waterless alcohol hand rub? *Clin Infect Dis* 2000;31(1):136–143.
4. Taha ET, Biggar RJ, Broadhead RL, Mtimavalye LAR, Miotti PG, Justesen AB, et al. Effect of cleansing the birth canal with antiseptic solution on maternal and newborn morbidity and mortality in Malawi: clinical trial. *Br Med J* 1997;315:216–220.
5. Kenyon S, Boulvain M, Neilson J. Antibiotics for preterm rupture of membranes (Cochrane Review). The Cochrane Library, Issue 4. Chichester, UK: John Wiley and Sons, Ltd, 2003.
6. French LM, Smaill FM. Antibiotic regimens for endometritis after delivery (Cochrane Review). The Cochrane Library, Issue 4. Chichester, UK: John Wiley and Sons, Ltd, 2003.
7. www.medscape.com/viewarticle/405871_4
8. Brown CE, Stettler RW, Twickler D, Cunningham FG. Puerperal septic pelvic thrombophlebitis: incidence and response to heparin therapy. *Am J Obstet Gynecol.* 1999 Jul;181(1):143-8.
9. Maternal Deaths in Sri Lanka-A Review of Estimates and Causes-1996.

4.5 Further reading

1. Adriaanse AH, Pel M, Bleker OP. Semmelweis: the combat against puerperal fever. *Eur J Obstet.Gynecol. Reprod Biol* 2000; 90(2): 153-8.
2. Abouzahr C, Aahman E, Guidotti R. Puerperal sepsis and other puerperal infections. In *Health dimensions of sex and reproduction: the global burden of sexually transmitted diseases, maternal conditions, perinatal disorders, and congenital anomalies*, eds. CJL Murray and AD Lopez WHO 1998
3. Fortney JA, Smith JB. Measuring maternal morbidity, in *Safe Motherhood Initiatives: critical issues*. Eds. Berer M and Ravindran TKS. *Reproductive Health Matters*, Blackwell Science, 1999
4. Sloan NL, Arthur P, Amoafu E et al. Validity of self reports to identify major obstetric complications. (Submitted for publication) (in ref 2)
5. Dare FO, Bako AU, Ezechi OC. Puerperal sepsis: a preventable postpartum complication. *Tropical Doctor* 1998;28:92-95.

6. Yokoe DS, Epidemiology of and Surveillance for postpartum infections. *Emerging Infections Disease* 2001; 7(5): 837-41 16 Jolly M, Sebire N, Harris J, Robinson S, Regan L. The risks
7. Waterstone M, Bewley S, Wolfe C. Incidence and predictors of severe obstetric morbidity: case-control study. *BMJ*. 2001;322(7294):1089-93
8. Smaill F, Hofmeyer GJ. Antibiotic prophylaxis for Caesarean Section. *Cochrane Database of systematic reviews*. Issue 1, 2002
9. Sloan NL, Langer A, Hernandez B, Romero M, Winikoff B. The etiology of maternal mortality in developing countries: what do verbal autopsies tell us? *Bulletin of the World Health Organisation*. 2001;79(9):805-10.
10. Ronsmans C, Vanneste AM, Chakraborty J, Van Ginneken J. A comparison of three verbal autopsy methods to ascertain levels and causes of maternal deaths in Matlab, Bangladesh. *Int J Epidemiol*. 1998 Aug;27(4):660-6.
11. Mathers CD, Stein C, Tomijima N, Ma Fat D, Rao C, Inoue M, Lopez AD, Murray CJL. (2002). *Global Burden of Disease 2000: Version 2 methods and results*. Geneva, World Health Organization (GPE Discussion Paper No. 50).
12. World Health Organization, UNICEF and UNFPA. *Maternal mortality in 1995: Estimates developed by WHO, UNICEF, UNFPA*. (WHO/RHR/01.9), Geneva, Switzerland, 2001.

General Guidelines

Asepsis and Universal Precautions

Sepsis contributes significantly to maternal and neonatal morbidity and mortality. All possible efforts should be made to minimize sepsis during labour and surgical procedures.

Working in the labour suite, operating theatre exposes the labour room staff to the risk of infection following contamination with infected body fluids. Staff should take necessary precautions to safeguard themselves from such occupational hazards.

Recommendation

All steps in the management of labour and surgical procedures should be carried out under aseptic conditions. Members of the staff should adhere to universal precautions at all times.

(Grade X)

Documentation

Meticulous documentation of all events would improve the quality of patient care and will be useful for future reference. Fetal heart tracings and other relevant reports should be attached to the bed head ticket.

Recommendation

All steps in the management of labour and surgical procedures should be documented in the bed head ticket of the patient. Such records should have the time, the observations, any decisions made and the name of the responsible health care attendant.

(Grade X)

Quality assurance

Quality assurance is an integral part of maintaining a good health care delivery system. Measures taken on this regard would contribute to institutional development as well as improvement in the standard of care in the country.

Internal clinical audit, institutional conferences and basic research activities are useful in improving standards of an institution.

In-service training in relevant areas and opportunities for continuous medical education should be made available to all grades of staff.

Recommendation

Regular audit cycles of the quality of labour ward practices and operating theatre procedures should be an important aspect of the functions of an obstetric and gynaecological unit. **(Grade Y)**