

## **Listeria Monocytogenes\***

### **The role of transabdominal amniocentesis in febrile patients with preterm labor**

**M. Mazor, M. Froimovich, S. Lazer, E. Maymon, and M. Glezerman**

Department of Obstetrics and Gynecology, Soroka Medical Center of Kupat Holim, Faculty of Health Sciences, Ben-Gurion University of the Negev, Beer-Sheva, Israel

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**Summary.** Two women with preterm labor and intraamniotic infection with *Listeria Monocytogenes* are presented. In both patients, the prenatal diagnosis of Listeriosis was made by transabdominal amniocentesis. The immediate prominent observation was meconium staining of the amniotic fluid. We propose that an amniocentesis should be performed in women with premature labor and fever. If the amniotic fluid is meconium stained and the Gram stain examination reveals Gram positive rods, *Listeria Monocytogenes* should be suspected and the patient should be treated accordingly until the culture results are obtained.

**Key words:** Intraamniotic infection – *Listeria Monocytogenes* – Preterm labor – Meconium – Amniocentesis

### **Introduction**

*Listeria Monocytogenes* is a Gram positive bacteria widely spread in nature and recognized as a cause of human disease since 1929. Listeriosis in pregnancy has been associated with higher rates of abortions, stillbirths and preterm deliveries [1–7]. During the neonatal period, several case reports have described an association between Listeriosis and neonatal septicemia and meningitis [8–10].

The purpose of this communication is to report two cases of preterm labor complicated by intraamniotic infection with Listeriosis and to suggest an appropriate diagnostic work-up and treatment.

### **Case 1**

A 25 years old primigravida was admitted at 30 weeks of gestation with premature labor and a breech presentation. The prenatal history was unremarkable. The presenting symptom was a “flu

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Correspondence to: Dr. Moshe Mazor, Director of High Risk Pregnancy Unit, Obstetrics and Gynecology Department, Soroka Medical Center, P.O. Box 151, Beer-Sheva 84101, Israel

like" illness with fever and diarrhoea that began one day prior to admission. Physical examination revealed a temperature of 38.3°C and regular uterine contractions occurring every 3–10 min. On pelvic examination the cervix was 50% effaced and 2 cm dilated with intact membranes and a breech presentation. Ultrasonic examination revealed a singleton live fetus, in footling presentation with normal amount of amniotic fluid and biometric measurements consistent with gestational age. The white blood cell count was 21,000/ml with a differential count of 71% polymorphonuclear and 17% band neutrophils. The urine sediment examination and chest X-ray were normal. An amniocentesis was performed and meconium stained amniotic fluid was obtained. A Gram stain examination of the amniotic fluid showed numerous Gram positive rods. A fetal lung maturity shake test was positive. Since the Gram stain revealed bacteria, no tocolysis was offered to the woman and she was allowed to deliver. Since the patient was in active labor with a footling presentation, cesarean section was performed and a normal girl weighing 1075 gr was delivered with Apgar scores of 4 at 1 min and 6 at 5 min. The umbilical artery pH was 7.28. Following the Gram stain results, parenteral Ampicillin treatment was administered to both mother and newborn.

*Listeria Monocytogenes* grew in the cultures obtained from maternal blood, amniotic fluid and placenta. Histological examination of the placenta showed chorioamnionitis and microabscesses. Endometritis that occurred in the puerperium was successfully treated by Ampicillin. Mother and her infant were discharged from hospital in good condition.

## Case 2

A 21 year old primigravida was admitted at 35 weeks of gestation with preterm labor and fever. The prenatal history was unremarkable. The presenting symptom in this patient was a "flu like" illness in association with fever that began two days prior to the admission. The body temperature was 38.7°C. The patient had regular uterine contractions with 60% cervical effacement, 1.5 cm dilatation and intact membranes with vertex presentation. Pooling and nitrazine tests were performed and excluded leakage of amniotic fluid. Ultrasound examination revealed a normally grown singleton, live fetus with a normal biophysical profile. The white blood cell count was 19,000/ml with 62% polymorphonuclear neutrophils and 21% bands. Urine sediment and chest X-ray were normal.

Amniocentesis for evaluation of the microbiological state of the amniotic cavity was performed and resulted in meconium stained amniotic fluid. A Gram stain examination of the amniotic fluid showed Gram positive rods with many white blood cells. The fetal lung maturity shake test was positive. The patient was allowed to deliver and parenteral Ampicillin therapy (8 gr/day) was administered. A normal girl weighing 2415 gr was spontaneously delivered with Apgar scores at 1 min and 5 min of 9 and 10, respectively. The umbilical artery pH was 7.31. *Listeria Monocytogenes* was isolated from cultures obtained from maternal blood, amniotic fluid and placenta. The histological examination of the placenta showed signs of acute chorioamnionitis of the membranes. Both mother and newborn left hospital in good condition.

## Discussion

*Listeria Monocytogenes* is a motile Gram positive bacillus widely distributed in nature. In 1986 the attack rate in U.S.A. was 7.1:1,000,000 in the general population. Feto-maternal cases were the most common (more than half of the cases) with an attack rate of 12.4:100,000 [9]. It seems that the attack rate is increasing constantly e.g. in Scotland it rose from 0.5:1,000,000 in 1971 to 7.0:1,000,000 in 1988 [11]. The most frequent serovar isolated is 4b [11–13] and it is more often associated with perinatal cases. The depressed cell mediated immunity observed in normal pregnant women can be responsible for their higher susceptibility to *Listeriosis* [14]. Moreover, the newborn can be more susceptible because of: 1) failure of interferon induction, 2) a low IgM level and a relatively low classical complement

**Table 1.** Outcome of 32 pregnancies complicated with *Listeria Monocytogenes*

Author [Ref.]	Year	N° patients	Normal outcome	Perinatal morbidity	Permanent damage	Fetal loss an perinatal death
Halliday [1]	79	12	–	6	3	3
Kong [10]	86	6	–	1	–	5
Valkenburg [2]	88	4	1	–	1	2
Romero [3]	88	2	2	–	–	–
Makar [4]	89	2	–	1	–	1
Cruikshank [6]	89	1	1	–	–	–
Buchdal [5]	90	3	–	–	1	2
Svare [7]	91	2	1	–	1	–
Total (%)		32	5 (15)	8 (25)	6 (19)	13 (41)

**Table 2.** *Listeria Monocytogenes* – Symptoms and signs during pregnancy

	N° of cases	%
Meconium stained amniotic fluid	24/32	75
Fever (>38°C)	20/32	62
“Flu like” illness	19/32	59
Premature contractions	16/32	50
Fetal distress	9/26 <sup>a</sup>	35
Leukocytosis (>15,000)	10/32	31
Premature rupture of membranes	3/32	9

<sup>a</sup> 26 live fetuses

pathway activity [4]. These properties for mother and baby make *Listeria Monocytogenes* a dangerous pathogen [1–10].

The pregnancy outcome of 32 cases is presented in Table 1 [1–7, 10]. Only 15% of women infected with *Listeriosis* had normal perinatal outcome; 41% the pregnancies were complicated by perinatal loss and 19% of the newborn became permanently damaged.

In Table 2 we reviewed the presenting symptoms and signs of *Listeriosis* in pregnancy. The patient usually presents with fever (62%) a “flu like” illness (59%) or premature contractions (50%). However, the most prominent feature is meconium stained amniotic fluid (75%) revealed either at amniocentesis [3, 6] or during delivery [1, 2, 4, 5, 10]. Sometimes the amniotic fluid is simply discolored or brownish and does not appear to be meconium stained.

An association between preterm labor, intrauterine infection and meconium stained amniotic fluid has been reported [15]. Indeed, the rate of positive amniotic fluid cultures was significantly higher in women with meconium stained amniotic fluid than in those with clear amniotic fluid (33% (10/30) vs. 11% (75/677)) [15]. Meconium may serve as a marker of the virulence of the bacteria and of poor outcome.

In women presenting with preterm labor and a "flu like" illness, an amniocentesis should be offered. If the amniotic fluid is meconium stained and contains Gram positive rods, the possibility of an intraamniotic infection with *Listeria Monocytogenes* should be seriously considered. In such cases parenteral Ampicillin, is simple and an effective treatment.

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