

## Chlamydial Pneumonitis in an Infant of a Vietnamese Refugee Family

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**D**R. KAREN OGLE (*Associate Director, Family Practice Residency*): Our discussion today will focus on two topics, both of relatively recent prominence, which came together in the diagnosis and management of a sick infant from our practice.

Chlamydia trachomatis was first described as a cause of pneumonitis in infancy in 1977.<sup>1</sup> Since that time it has become recognized as a major cause of lower respiratory tract disease in infants, identified in up to three quarters of infants aged less than 6 months with afebrile pneumonia.<sup>2</sup> The major determinant of infection in the newborn is chlamydial infection of the cervix of the mother. There is general consensus that the national average incidence of chlamydial infection of the cervix in the United States is 4 to 5 percent of sexually active women. Rates as high as 25 to 30 percent have been detected in prospective screening of certain populations.<sup>3</sup> In most studies, about 40 to 50 percent of the exposed infants developed conjunctivitis and 20 percent developed pneumonia. About 70 percent of exposed infants show seroconversion.<sup>4-6</sup>

Since 1975 there has been a mass exodus of more than one million people from Southeast Asia. Approximately one-half million Indochinese refugees have resettled in the United States. These refugees have a number of health problems not commonly encountered in the United States, and these problems must be considered in the differential diagnostic approach to their presenting complaints. In addition, many refugees are unfamiliar with traditional Western medicine as practiced in the United States. Indochinese refugees repre-

sent a wide range of cultural and socioeconomic backgrounds, ranging from Western-trained professionals to peasants illiterate in their native language with no exposure to Western scientific concepts. This wide range in background, as well as major differences in the culture of their countries of origin (Vietnam, Cambodia, and Laos), makes it difficult to generalize recommendations for health care.<sup>7,8</sup> We will discuss both of these topics in the context of an infant who presented to the Family Health Center.

**DR. QUAN NGUYEN** (*First-year Family Practice Resident*): Steven T. is a Vietnamese male infant seen for the first time in the Family Health Center at age 7 weeks with a 10-day history of runny nose, sneezing, and cough. There was no history of fever, conjunctivitis, or feeding difficulties. The physical examination was normal with the exception of crusted nares. Weight gain had been good since birth. A diagnosis of upper respiratory tract infection and viral bronchitis was made, and Robitussin recommended as treatment. Both of Steven's parents accompanied him on this visit. Neither one spoke any English, but they had not brought one of their older children to act as a translator, as they customarily did, because they knew their appointment was with a physician who was also from Vietnam.

Five days later, Steven's mother, father, and six of their older children brought him to the emergency room at midnight on a Friday night. His upper respiratory symptoms had persisted and his cough worsened. Although he still took his bottle well, they had noted increasing respiratory distress. That evening they noted an episode of facial cyanosis following a coughing paroxysm. No fever or symptoms outside the respiratory tract had been noted. Steven had been treated with Chinese folk medicine with minimal improvement.

Steven T. was the product of a normal, spontaneous vaginal delivery of a 40-year-old gravida 13, para 13 Vietnamese woman with a history of  $\beta$ -thalassemia. His birth weight was 6 lb 13 oz with a one-minute Apgar of 8, five-minute Apgar of 9.

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He was the 13th child in a family from a small village on the coast of central Vietnam. Steven's parents as well as their extended family were fishermen who had their own boats. Because of this, when they made the decision to leave Vietnam in 1976, almost all of their very large extended family was also able to leave. Steven's family spent some time in a refugee camp in Southeast Asia and was then resettled in the United States in a coastal area of Texas, where they pursued the fishing profession. After two years there, they moved to Michigan, where the majority of the extended family had been resettled. The oldest of the 13 children in the family is aged 18 years and the oldest three children speak English very well, generally serving as interpreters for the parents in most of their contacts outside the refugee community. Neither of Steven's parents is formally employed, and with no marketable skills or English, it would be nearly impossible for them to obtain employment that would reach the level of support that the Aid to Dependent Children program provides them now.

On admission to the hospital, physical examination revealed a well-hydrated alert male infant in moderate respiratory distress. His temperature was 101°F (38.3°C) rectally, pulse 162 beats per minute, and respirations 46/min. Weight was 9 lb. The examination was remarkable for nasal flaring and subcostal and supraclavicular retractions. Coarse breath sounds were heard in all lung fields with no wheezing, rales, or rhonchi. Liver edge was palpable 2.5 cm below the right costal margin. He sucked well despite his respiratory distress.

The results of initial laboratory studies included a white blood cell count of  $15 \times 10^3/\mu\text{L}$  with 63 percent lymphocytes and 8 percent eosinophils. Hemoglobin was 10.3 g/dL and hematocrit 32.2 percent. Urinalysis was normal. Capillary blood gases on room air showed a pH of 7.35, carbon dioxide partial pressure ( $\text{PCO}_2$ ) of 45.8 mmHg, and oxygen partial pressure ( $\text{PO}_2$ ) of 48.4 mmHg. Chest x-ray results revealed an extensive alveolar-type infiltrate in the hilar and perihilar regions of both lungs along with hyperexpansion.

In conjunction with a pediatric consultant, a presumptive diagnosis of chlamydial pneumonia was made. Treatment with erythromycin 40 mg/kg/d and respiratory support were begun. Approximately eight hours after admission, the decision was made to transfer Steven to a nearby hospital with a pediatric intensive care unit because he continued to need intensive monitoring of blood gases and respiratory treatment to maintain an acceptable  $\text{PO}_2$ . His respiratory status stabilized within 24 hours after transfer and improved steadily. He was discharged after five days to continue erythromycin therapy as an outpatient.

DR. OGLE: The decision to transfer Steven was a difficult one, in part because of the linguistic and cul-

tural barriers to communicating about the decision with his family. Fortunately, Dr. Nguyen was rotating on the service to which the patient was transferred.

DR. NGUYEN: The linguistic barriers are significant in the care of non-English-speaking patients. Interpretation requires a great deal of skill and is complicated by multiple issues that really deserve a conference of their own. Two of these issues that were clearly present for this family, who were using a 16-year-old daughter as an interpreter prior to seeing me, were the interpreter's lack of knowledge of health care terminology and the complexities of relationships between the interpreter and patient. A recent article discusses the multiple issues of cross-cultural communication thoroughly.<sup>9</sup>

DR. HENRY BARRY (*Co-Chief Resident, Family Practice*): There are several issues of concern to a family about hospitalization of a sick infant that we usually consider and, in many cases, provide anticipatory guidance about: external commitments of one or both parents, such as employment and care of other children; fear and apprehension about both the health of their child and threatening medical procedures; separation concerns; and the strain of having the caregiving role assumed by others. The infant is also stressed by sudden separation, fear of the unfamiliar, and painful or frightening procedures. It seems to me there would be some special concerns added for this family displaced from their home country.

DR. NGUYEN: That is true, especially for this family. As you know, refugees from Southeast Asia come from a wide variety of socioeconomic and cultural backgrounds. Steven's family had little or no formal education, most members could not read or write in Vietnamese, and they would have had virtually no exposure to Western medicine prior to their departure. So the English-Vietnamese language barrier is only the beginning of the communication problems in this case. Their perceptions of and expectations from medical care are, in many areas, widely divergent from the traditional Western model.

There have been several articles published in the American medical literature that outline cultural and religious experiences and beliefs that many Southeast Asians bring to a visit with a physician.<sup>7,8,10</sup> The following five are the most significant:

1. The Southeast Asian refugee patient may deal with uncertainty and authority in a passively obedient way that fits well with his culture but poorly with the standard practice of Western medicine. The physician is seen as highly skilled and educated and, therefore, is highly respected. Frequently, even if the patient strongly disagrees with the treatment recommended, he will protect the health professional's status by concealing these feelings and his noncompliance.

2. The expectation that the physician is expert in diagnosis and treatment may cause the patient not to contribute valuable information about history or effects of therapy.

3. The patient may be embarrassed by his own ignorance of Western medicine and conceal his lack of understanding to protect his self-esteem (saving face).

4. The family unit is very important to most Southeast Asian refugees. Most of the cultures are strongly patriarchal (except the Khmer) and place high emphasis on the extended family. Recognizing this importance can put the patient and family at ease by involving them in diagnosis and treatment. In addition, sensitivity to the loneliness and depression that may be suffered because of separation from family may aid in management.

5. The self-care model is much stronger in Southeast Asians than in Americans, often because of the lack of availability of any other care in their home country and because of strong belief in folk remedies.

**SOCIAL WORKER:** What about the use of traditional folk treatments in Steven's case? Did he show any signs of coin rubbing?

**DR. NGUYEN:** We saw no sign of coin rubbing (*cao gió*) treatment with Steven. It is used by Southeast Asian refugees in this area, as is skin scarification. Cupping, a common folk treatment in Vietnam, is not used in our area, primarily, I think, because of a lack of the proper equipment. Probably in very large metropolitan areas with large Chinese and Asian subcultures, such equipment is more easily available. It is important to be aware of these practices because there have been numerous instances in which they have been mistaken for child abuse.<sup>11,12</sup>

**FAMILY PHYSICIAN IN THE AUDIENCE:** Many Southeast Asians that I care for seem disproportionately concerned about venipuncture. Why is that?

**DR. NGUYEN:** Loss of blood is seen as particularly threatening to health. Where possible, try to avoid blood tests for these patients, particularly early in your relationship. Once trust has been established, it will be easier to explain the reasons for blood tests and have the action accepted. Although most parents find the experience of having their infant poked with needles disturbing, Steven's mother was especially worried because of her perception of its risk as well as its pain.

**DR. BARRY:** I have read about the importance of the Chinese concept of yin and yang in the Chinese folk medicine practiced in many areas of Vietnam. From what I understand, the balance of hot and cold, dry and wet, is seen as very important in the treatment of disease. As lung disease is considered basically a cold and wet disease in this system, did his parents have concerns about his receiving oxygen inside a

cool mist tent?

**DR. NGUYEN:** I did not see that as an issue in this case, though it could be of real concern with other refugees. Mr. and Mrs. T. basically have a lot of faith in the Western medical system and accept most of what we say as right.

**DR. OGLE:** Yet, Steven has never been seen for any of his recommended well-baby visits, and although Mrs. T. did come for some prenatal care in our office during her last three pregnancies, she did not attend with the frequency we recommended.

**DR. NGUYEN:** I think it is important to realize that many Southeast Asian refugees have expectations from a medical care system different from those we can anticipate. Patients such as this family fail to understand our reasoning in recommending preventive medical visits. The whole notion of going to a doctor for any sort of preventive care is completely alien. This situation is true not only here, but also was common in my general practice in Vietnam. I cannot explain why, but it can possibly be explained by the strong tradition of self-care for illness (often because of lack of availability of any other care) as well as extensive social and political disregard for public health activities.

After being seen, Southeast Asian refugee patients are also much less likely to be seen for follow-up. If they have improved, they will likely be satisfied and see no reason to return. If they have not improved or have worsened, they may come back, or they may seek another source of care. I found this common in my practice in Vietnam also. In addition, in many instances even if a prescription or treatment is accepted, it will likely be given according to the patient's own judgment. For example, in Steven's case, although erythromycin was prescribed four times a day, I suspect that he was more likely to receive a dose of his medicine when he was coughing more.

**DR. OGLE:** Let's get back to Steven's diagnosis and treatment once again. In the vast majority of infants, chlamydial pneumonia is recognized between four weeks and three months, sometimes but not always preceded by conjunctivitis. The infants are usually afebrile or have only minimal fever. Upper respiratory tract symptoms include congestion and obstruction without significant discharge; the finding of abnormal-appearing eardrums is quite common, occurring in more than one half of the cases in one study. Lower respiratory tract symptoms consist of a prominent, often paroxysmal, cough. Inspiratory rales are often heard, expiratory wheezes uncommonly. Radiographic findings in the majority of cases include hyperexpansion and bilateral interstitial infiltrates. Laboratory findings usually include a fairly normal white blood cell count with an increase in the number of eosinophils. Immunoglobulin G levels greater than

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## GLUCOTROL® (glipizide) Tablets Brief Summary of Prescribing Information

**INDICATIONS AND USAGE:** GLUCOTROL is indicated as an adjunct to diet for the control of hyperglycemia in patients with non-insulin-dependent diabetes mellitus (NIDDM, type II) after an adequate trial of dietary therapy has proved unsatisfactory.

**CONTRAINDICATIONS:** GLUCOTROL is contraindicated in patients with known hypersensitivity to the drug or with diabetic ketoacidosis, with or without coma, which should be treated with insulin.

**SPECIAL WARNING ON INCREASED RISK OF CARDIOVASCULAR MORTALITY:** The administration of oral hypoglycemic drugs has been reported to be associated with increased cardiovascular mortality as compared to treatment with diet alone or diet plus insulin. This warning is based on the study conducted by the University Group Diabetes Program (UGDP), a long-term prospective clinical trial designed to evaluate the effectiveness of glucose-lowering drugs in preventing or delaying vascular complications in patients with non-insulin-dependent diabetes. The study involved 823 patients who were randomly assigned to one of four treatment groups (*Diabetes* 19, supp. 2:747-830, 1970).

UGDP reported that patients treated for 5 to 8 years with diet plus a fixed dose of tolbutamide (1.5 grams per day) had a rate of cardiovascular mortality approximately 2-1/2 times that of patients treated with diet alone. A significant increase in total mortality was not observed, but the use of tolbutamide was discontinued based on the increase in cardiovascular mortality, thus limiting the opportunity for the study to show an increase in overall mortality. Despite controversy regarding the interpretation of these results, the findings of the UGDP study provide an adequate basis for this warning. The patient should be informed of the potential risks and advantages of GLUCOTROL and of alternative modes of therapy.

Although only one drug in the sulfonylurea class (tolbutamide) was included in this study, it is prudent from a safety standpoint to consider that this warning may also apply to other oral hypoglycemic drugs in this class, in view of their close similarities in mode of action and chemical structure.

**PRECAUTIONS: Renal and Hepatic Disease:** The metabolism and excretion of GLUCOTROL may be slowed in patients with impaired renal and/or hepatic function. Hypoglycemia may be prolonged in such patients should it occur.

**Hypoglycemia:** All sulfonylureas are capable of producing severe hypoglycemia. Proper patient selection, dosage and instructions are important to avoid hypoglycemia. Renal or hepatic insufficiency may increase the risk of hypoglycemic reactions. Elderly, debilitated, or malnourished patients and those with adrenal or pituitary insufficiency are particularly susceptible to the hypoglycemic action of glucose-lowering drugs. Hypoglycemia may be difficult to recognize in the elderly or people taking beta-adrenergic blocking drugs. Hypoglycemia is more likely to occur when caloric intake is deficient, after severe or prolonged exercise, when alcohol is ingested, or when more than one glucose-lowering drug is used.

**Loss of Control of Blood Glucose:** A loss of control may occur in diabetic patients exposed to stress such as fever, trauma, infection or surgery. It may then be necessary to discontinue GLUCOTROL and administer insulin.

**Laboratory Tests:** Blood and urine glucose should be monitored periodically. Measurement of glycosylated hemoglobin may be useful.

**Information for Patients:** Patients should be informed of the potential risks and advantages of GLUCOTROL, of alternative modes of therapy, as well as the importance of adhering to dietary instructions, of a regular exercise program, and of regular testing of urine and/or blood glucose. Advantages of hypoglycemia, its symptoms and treatment, and conditions that predispose to its development should be explained to patients and responsible family members. Primary and secondary failure should also be explained.

**Drug Interactions:** The hypoglycemic action of sulfonylureas may be potentiated by certain drugs including non-steroidal anti-inflammatory agents and other drugs that are highly protein bound, salicylates, sulfonamides, chloramphenicol, probenecid, coumarins, monoamine oxidase inhibitors, and beta adrenergic blocking agents. *In vitro* studies indicate that GLUCOTROL binds differently than tolbutamide and does not interact with salicylate or dicumarol. However, caution must be exercised in extrapolating these findings to a clinical situation. Certain drugs tend to produce hyperglycemia and may lead to loss of control, including the thiazides and other diuretics, corticosteroids, phenothiazines, thyroid products, estrogens, oral contraceptives, phenytoin, nicotinic acid, sympathomimetics, calcium channel blocking drugs, and alcohol. **Carcinogenesis, Mutagenesis, Impairment of Fertility:** A 20-month study in rats and an 18-month study in mice at doses up to 75 times the maximum human dose revealed no evidence of drug-related carcinogenicity. Bacterial and *in vivo* mutagenicity tests were uniformly negative. Studies in rats of both sexes at doses up to 75 times the human dose showed no effects on fertility.

**Pregnancy:** Pregnancy Category C: GLUCOTROL (glipizide) was found to be mildly fetotoxic in reproductive studies at all dose levels (5-50 mg/kg). This fetotoxicity has been similarly noted with other sulfonylureas, such as tolbutamide and tolazamide. The effect is perinatal and believed to be directly related to the pharmacologic (hypoglycemic) action of GLUCOTROL. In studies in rats and rabbits no teratogenic effects were found. There are no adequate and well-controlled studies in pregnant women. GLUCOTROL should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Because recent information suggests that abnormal blood glucose levels during pregnancy are associated with a higher incidence of congenital abnormalities, many experts recommend that insulin be used during pregnancy to maintain blood glucose levels as close to normal as possible.

**Nonteratogenic Effects:** Prolonged severe hypoglycemia has been reported in neonates born to mothers who were receiving a sulfonylurea drug at the time of delivery. This has been reported more frequently with the use of agents with prolonged half-lives. GLUCOTROL should be discontinued at least one month before the expected delivery date.

**Nursing Mothers:** Since some sulfonylurea drugs are known to be excreted in human milk, insulin therapy should be considered if nursing is to be continued.

**Pediatric Use:** Safety and effectiveness in children have not been established.

**ADVERSE REACTIONS:** In controlled studies, the frequency of serious adverse reactions reported was very low. Of 702 patients, 11.8% reported adverse reactions and in only 1.5% was GLUCOTROL discontinued.

**Hypoglycemia:** See PRECAUTIONS and OVERDOSAGE sections.

**Gastrointestinal:** Gastrointestinal disturbances, the most common, were reported with the following approximate incidence: nausea and diarrhea, one in 70; constipation and gastralgia, one in 100. They appear to be dose-related and may disappear on division or reduction of dosage. Cholestatic jaundice may occur rarely with sulfonylureas. GLUCOTROL should be discontinued if this occurs.

**Dermatologic:** Allergic skin reactions including erythema, morbilliform or maculopapular eruptions, urticaria, pruritus, and rash have been reported in about one in 70 patients. These may be transient and may disappear despite continued use of GLUCOTROL; if skin reactions persist, the drug should be discontinued. Porphyria cutanea tarda and photosensitivity reactions have been reported with sulfonylureas.

**Hematologic:** Leukopenia, agranulocytosis, thrombocytopenia, hemolytic anemia, aplastic anemia, and pancytopenia have been reported with sulfonylureas.

**Metabolic:** Hepatic porphyria and disulfiram-like alcohol reactions have been reported with sulfonylureas. Clinical experience to date has shown that GLUCOTROL has an extremely low incidence of disulfiram-like reactions.

**Miscellaneous:** Dizziness, drowsiness, and headache have each been reported in about one in fifty patients treated with GLUCOTROL. They are usually transient and seldom require discontinuance of therapy.

**OVERDOSAGE:** Overdosage of sulfonylureas including GLUCOTROL can produce hypoglycemia. If hypoglycemic coma is diagnosed or suspected, the patient should be given a rapid intravenous injection of concentrated (50%) glucose solution. This should be followed by a continuous infusion of a more dilute (10%) glucose solution at a rate that will maintain the blood glucose at a level above 100 mg/dL. Patients should be closely monitored for a minimum of 24 to 48 hours since hypoglycemia may recur after apparent clinical recovery. Clearance of GLUCOTROL from plasma would be prolonged in persons with liver disease. Because of the extensive protein binding of GLUCOTROL (glipizide), dialysis is unlikely to be of benefit.

**DOSE AND ADMINISTRATION:** There is no fixed dosage regimen for the management of diabetes mellitus with GLUCOTROL; in general, it should be given approximately 30 minutes before a meal to achieve the greatest reduction in postprandial hyperglycemia.

**Initial Dose:** The recommended starting dose is 5 mg before breakfast. Geriatric patients or those with liver disease may be started on 2.5 mg. Dosage adjustments should ordinarily be in increments of 2.5 mg, as determined by blood glucose response. At least several days should elapse between titration steps.

**Maximum Dose:** The maximum recommended total daily dose is 40 mg.

**Maintenance:** Some patients may be effectively controlled on a once-a-day regimen, while others show better response with divided dosing. Total daily doses above 15 mg should ordinarily be divided.

**HOW SUPPLIED:** GLUCOTROL is available as white, dye-free, scored diamond-shaped tablets imprinted as follows: 5 mg tablet—Pfizer 411 (NDC 5 mg 0049-4110-66) Bottles of 100; 10 mg tablet—Pfizer 412 (NDC 10 mg 0049-4120-66) Bottles of 100.

**CAUTION:** Federal law prohibits dispensing without prescription.

More detailed professional information available on request.

## CHLAMYDIAL PNEUMONITIS

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500 mg/dL and immunoglobulin M levels greater than 110 mg/dL are also common. A definitive diagnosis, which depends on recovery of the organism or serologic diagnosis,<sup>1,3,13,14</sup> often occurs well after a clinical diagnosis has been made and the patient has been treated and improved, so recognition of the clinical picture is very important. Specific immunoglobulin M microimmunofluorescence, when available, is the test of choice for serologic diagnosis.<sup>14</sup>

Although the infant with a classic presentation in the first four months of life (such as Steven T.) is very likely to have chlamydial disease, many infants do not present classically, and other etiologic agents may cause a similar illness. The most common pneumonia in early infancy is viral, mainly respiratory syncytial virus, which is more likely to be associated with expiratory wheezing and not to demonstrate eosinophilia. Many other viruses are common. Bacterial pneumonia may also be confused with a chlamydial infection, though patients are generally more toxic and febrile and show consolidation rather than interstitial infiltrates on x-ray examination. Pertussis and *Pneumocystis carinii* should also be considered.<sup>3</sup>

**FAMILY PRACTICE RESIDENT:** What additional differential diagnoses were considered in Steven's case because of the refugee status of his family?

**FAMILY PRACTICE RESIDENT:** I was the senior resident the night Steven was admitted, and this question was of considerable concern to me. Certainly tuberculosis was an important consideration for a child from a refugee family presenting with respiratory symptoms. In addition, however, Steven's marked eosinophilia made me wonder about any unusual parasitic diseases that I might not have heard of since my bacteriology final examination during my second year of medical school! However, our pediatric infectious diseases consultant did not consider any other major differential diagnoses.

**FAMILY HEALTH CENTER NURSE:** Is there good evidence that treatment actually changes the course of this disease?

**DR. OGLE:** There is evidence that erythromycin shortens the clinical course and also decreases nasopharyngeal shedding.<sup>3,15</sup> The effect certainly is not so dramatic as that of penicillin on pneumococcal pneumonia, for example. In one controlled trial, sulfisoxazole was equally effective. Supportive care is also very important in treatment, including attention to nutrition, fluid, and electrolyte balance, and assessing the need for oxygen or other ventilatory support. It is worth noting that presence of chlamydial infection in the infant generally signifies maternal infection, so the mother and her sexual partner should be treated as well. There are reports of second cases of chlamydial infection when the mothers were not treated. What follow-up do you have in this case, Dr. Nguyen?

DR. NGUYEN: Despite our earlier discussion, Steven was seen for his posthospitalization follow-up visit, at which time he had completed his course of erythromycin. He was essentially asymptomatic and had continued to gain weight. However, he still has not been seen for any well-baby visits and has had only one further visit since his illness as a brief sick call for a skin rash. Because of the propensity of this family to be seen only for acute care, it has been difficult to have one physician providing continuous care. Partly as a result of this, Steven's mother and father have not yet been treated for chlamydial infection.

FAMILY PRACTICE RESIDENT: That raises the issue of preventing chlamydial disease in newborns. How do we approach this?

DR. OGLE: The first direct step in prevention is screening pregnant women for the presence of Chlamydia in the endocervix. Now that the direct-smear fluorescent antibody test and enzyme immunoassays are widely and inexpensively available, our ability to screen the population of pregnant women, particularly those at high risk, is greatly enhanced.

As is true with all diagnostic tests, even very sensitive and specific ones, the predictive value of a positive test is much lower in a low-prevalence population than in a high-risk group. For this reason, although the screening tests for Chlamydia in the endocervix (especially the direct-smear fluorescent antibody test) are highly specific and sensitive, the value of screening in a low-risk population remains to be defined. The Centers for Disease Control policy guidelines specifically recommend screening at the first prenatal visit for the pregnant women in the following groups: those less than 20 years of age, unmarried women, and women with multiple sex partners or a history of other sexually transmitted diseases. Recommended treatment of pregnant women with positive smears is erythromycin base 500 mg or erythromycin ethyl succinate 800 mg four times a day for seven days.<sup>14</sup> The efficacy of treatment has been recently studied and found to have a high success rate and a relatively low intolerance rate. Infant morbidity was substantially reduced.<sup>16</sup>

The second step in preventing pneumonia in newborns is systemic treatment of chlamydial conjunctivitis. Although evidence suggests that conjunctivitis is successfully treated topically or orally, topical treatment does not eradicate nasopharyngeal carriage and therefore leaves a continued risk for pneumonia as well as recurrent conjunctivitis.

Although the use of an erythromycin ophthalmic

ointment is effective in preventing chlamydial as well as gonococcal conjunctivitis, it does not prevent nasopharyngeal chlamydial infection or pneumonia.

Screening for all neonates for infection is not recommended by most authorities. When conjunctivitis is present in the neonate, appropriate tests for gonococcus and Chlamydia should be done.

Of course, public health measures to control this sexually transmitted disease are important in addition to direct treatment of pregnant women and infants.

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