

## Abstract

To better understand the extent of the concerns confronting teratogen information services following a disaster situation, we present a review of inquiries received following the terrorist attacks on September 11, 2001 and the acts of bio-terrorism that followed. Information was requested from members of the Organization of Teratology Information Services (OTIS) via the listserv. Analysis of these data showed that thirty-six percent of inquiries were about toxins or pollutants and environmental health risks in the immediate and surrounding vicinity of "ground zero". Potential toxins from the destructive impact and resulting collapse of the World Trade Center were difficult to identify and quantify. Therefore, the development of fetal risk assessments was complex. For example, it was difficult to adequately assess air quality or alleged particulate matter in the ambient air. Fifty-five percent of inquiries concerned the possible fetal effects of anthrax exposure, antibiotic protocols, or anthrax vaccine. The remaining nine percent of inquiries concerned the effects of maternal stress, anxiety, or depression on the developing fetus. Our review suggests that teratogen information services are strategically positioned to respond to inquiries concerning prenatal exposures following a disaster situation. However, data concerning the majority of exposures and concerns about public health were largely unavailable.

## Introduction

Exposure following a catastrophic event evokes various questions and concerns from pregnant women and health care providers. Teratology information services (TISs) are uniquely positioned to collect data concerning such exposures and possibly provide fetal risk assessments in such situations. The Pregnancy Risk Network, a TIS located in Western New York, conducted a review of inquiries to members of the Organization of Teratology Information Services following the events on September 11, 2001 and occurrences of bio-terrorism that followed. Although the number of inquiries was small, our data suggest that teratogen counseling following a disaster situation differentiates concerns regarding maternal health risks comparative to fetal risks associated with prenatal exposures.

## Methods

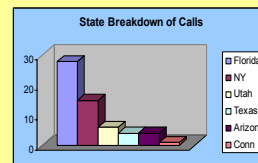
We conducted an observational analysis of inquiries received from September 11, 2001 through February 28, 2002 using a survey via the listserv to members of OTIS. For the purpose of this report, we obtained information concerning various types of exposures relative to air quality, environmental pollutants, and toxins near areas of the World Trade Center and Pentagon attacks. Information was reviewed regarding inquiries concerning anthrax, anthrax vaccine, and antibiotic protocols. We also inquired about calls concerning stress and the possible effects during pregnancy. The data were analyzed according to the following categories: environmental or health-related concerns, anthrax information, and stress. Each inquiry also was classified by the state receiving the call.

## Results

The results are set forth in the tables. Of the 15 member services that responded to the survey, a total of 58 inquiries to six TISs were found to be relative to the events of September 11<sup>th</sup> (Table 1). Eight services reported no inquiries. The March of Dimes Resource Center also provided inquiry information for the survey, but data specific to the events of September 11<sup>th</sup> could not be analyzed and are not considered in this analysis.

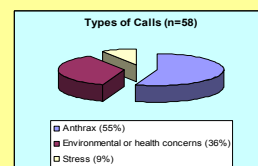
## Post-Disaster Teratogen Counseling: The Events Associated with September 11, 2001 S. Mach, S. Gangell, L.K. Robinson Pregnancy Risk Network, New York

Table 1



Types of inquiries are detailed in Table 2. Thirty-two of 58 inquires (55%) concerned possible effects of *B. anthracis*, anthrax vaccine, or antibiotic agents such as ciprofloxacin. Twenty-one inquiries (36%) concerned air quality, environmental pollutants, and general health-related concerns. Five inquiries (9%) concerned the effects of maternal stress on the developing fetus.

Table 2



## Discussion

The Pregnancy Risk Network (PRN) collaborated with other teratogen information services to evaluate the nature of inquiries surrounding the events of September 11<sup>th</sup> and thereafter. In addition to the PRN, five TISs contributed inquiry information (Arizona, Connecticut, Florida-Gainesville, Texas, and Utah). Seven TISs (Florida-Tampa, Illinois, Michigan, Missouri, New Jersey, North Dakota, and Washington) reported no inquiries were received pertinent to this survey. Workplace Hazards for Reproductive Health (Wisconsin) also reported no inquiries. Review of data provided by the March of Dimes Resource Center in New York showed no substantial increase or pattern in the number or nature of inquiries. In fact, the Resource Center reported a slight decrease in the number of inquiries received in comparison to the same time period during the previous year.

Environmental health risk concerns were diverse. Of the 58 inquiries received by the TISs, 21 inquiries or 36%, were relative to air quality and potential toxicity of various environmental exposures in the vicinity of the World Trade Center. A majority of these inquiries concerned levels of asbestos, carbon monoxide, hazardous or flammable gases, and air particulates near "ground zero". Effects of smoke, dust, and chemical inhalation were also noted. While there are no data concerning the possible fetal effects of these agents in substantial doses, none have been implicated as causing birth defects in humans. No inquiries were received specific to the Pentagon attack or nearby areas.

Thirty-two inquiries or 55%, concerned the possible fetal effects of anthrax exposure, antibiotic prophylaxis, and anthrax vaccine. Conclusive studies are lacking regarding the risk of birth defects after prenatal exposure to anthrax and anthrax vaccine. As reported by health authorities, individuals with confirmed contamination or known exposure to a high-risk source were given consideration for antibiotic prophylaxis. The use of ciprofloxacin during pregnancy and the risk of birth defects were frequent questions to teratogen counselors as a result of potential anthrax exposures. To date, there are no conclusive data concerning fetal exposure to ciprofloxacin.

The remaining five inquiries or 9%, were questions concerning stress and pregnancy. Although this represents a small number of inquiries, it is important to note that stress, panic, and generalized anxiety are psychological responses to a traumatic event. As a result of increasing concerns about the effects of stress during pregnancy, the March of Dimes developed a pamphlet which provides information on managing stress during pregnancy. Emphasis is placed on the recognition of stress and suggestions for ways to reduce stress. This pamphlet also provides information about the signs of pre-term labor, which some studies suggest may be triggered by high levels of stress during pregnancy.

Further review of our database showed an increase in the number of inquiries to our service regarding prescription medications for depression, anxiety, and sleeplessness from callers in the New York City area following the events of September 11<sup>th</sup>. Fourteen inquiries originated from pregnant women who were either currently taking antidepressants or anti-anxiety agents or who were considering medication therapy for depression or anxiety. Inquiries were also noted regarding the use of sedative agents for short-term treatment of insomnia.

## Conclusion

Teratogen counseling involves the gathering of intake information and review of data concerning exposures prior to communicating comprehensive risk assessments. Utilization of a standardized protocol for intake assessment serves as an effective means of gathering data concerning potential risks during pregnancy. Future modifications to intake assessments may include recognition of maternal health risks, public health concerns, and appropriate sources of referral and intervention. Our experience suggests that by being accessible to a broad segment of the population, teratogen information services are positioned to respond to inquiries related to terrorism. However, data concerning related exposures is incomplete, therefore potential risks to the developing fetus are not known.

## Acknowledgements

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