



Awareness of *Listeria* and high-risk food consumption behavior among pregnant women in Louisiana



Wenqing Xu^{a, *}, Melissa Cater^b, Adriana Gaitan^a, Merritt Drewery^a, Rebecca Gravois^b, Carol J. Lammi-Keefe^{a, c}

^a School of Nutrition and Food Sciences, Louisiana State University AgCenter, Baton Rouge, LA 70803, USA

^b Department of Agricultural and Extension Education & Evaluation, Louisiana State University AgCenter, Baton Rouge, LA 70803, USA

^c Pennington Biomedical Research Center, Baton Rouge, LA 70808, USA

ARTICLE INFO

Article history:

Received 30 September 2016

Received in revised form

12 December 2016

Accepted 15 January 2017

Available online 18 January 2017

Keywords:

Listeriosis

Pregnant women

Listeria awareness

High-risk food consumption

ABSTRACT

Listeria monocytogenes is transmitted predominantly through contaminated food. About one in seven (14%) cases of *Listeria* infection occurs during pregnancy. In this study, we assessed the awareness of foodborne pathogens including *Listeria* and high-risk food consumption, among 218 pregnant women in southeastern Louisiana parishes in and around an urbanized area. The results showed the relationship between awareness of *Listeria* and selected demographic variables, such as age, race, and education level. The majority (71.1%) of pregnant women reported the consumption of high-risk foods during pregnancy. One person reportedly consumed six of the seven high-risk foods. Gaps existed between awareness of *Listeria* and high-risk food consumption behaviors, although as pregnant women's awareness of *Listeria* increased, their high-risk food consumption behaviors decreased. Targeted continuing education for pregnant women in Louisiana should address the gaps identified in this study.

© 2017 Elsevier Ltd. All rights reserved.

1. Introduction

Listeriosis is one of the most lethal bacterial diseases for fetuses and infants. It is a foodborne infection that is caused by the bacterium *Listeria monocytogenes* and typically affects pregnant women, newborn infants, elderly, and individuals with compromised immune systems. Research has shown that down-regulation of the cellular immune system induced by hormonal changes during pregnancy increase the risk of pregnant women experiencing foodborne illness (Smith, 1999). In the United States, an estimated 1600 people get infected by *Listeria* each year with 260 resulting deaths (Scallan et al., 2011). About one in seven (14%) cases of *Listeria* infection occurs during pregnancy (CDC, 2013). It has been reported that pregnant women are about 10 times more likely than the general population to get Listeriosis (CDC, 2013). Although the increased listeriosis incidence reported among older adults has been noticed in the United Kingdom (Evans & Redmond, 2016), incidence rates among pregnant women in the USA (3.42 cases per 100,000 population) was higher than adults aged more

than 65 years (1.21 cases per 100,000 population) (Silk et al., 2012). Listeriosis during pregnancy can cause fetal loss (miscarriage or stillbirth), preterm labor, and illness or death in newborn infants, while pregnant women who get infected with *Listeria* may experience only mild symptoms, making the diagnosis difficult.

L. monocytogenes is transmitted predominantly through contaminated food (Schlech et al., 1983). Although most cases are sporadic (i.e., not outbreak-related) (Varma et al., 2007), from 2011 to 2016, there have been ten multistate outbreaks in the United States associated with several food items, including cantaloupes, cheeses, packaged salads, prepackaged caramel apples, and ice cream (CDC, 2016). Listeriosis is the third leading cause of death among major pathogens transmitted commonly by food (Scallan et al., 2011). In 2011, contaminated cantaloupes from a single farm caused 33 deaths which was the deadliest U.S. foodborne outbreak in nearly 90 years (CDC, 2011). A Food and Drug Administration (FDA) and United States Department of Agriculture-Food Safety and Inspection Service (USDA-FSIS) risk assessment identified that Ready-To-Eat (RTE) deli meats were the most important source of *Listeria* among 23 different RTE food groups studied (FDA and USDA-FSIS, 2003). From 2012 to 2014, there have been 32 recalls because of potential *L. monocytogenes* contamination, while 18 of which were related to RTE or cooked meat/poultry product

* Corresponding author.

E-mail address: Wenqing.Xu@agcenter.lsu.edu (W. Xu).

(USDA-FSIS, 2015).

In the state of Louisiana, from 1965 to 2001, reports of listeriosis were sporadic (LADHH, 2015). Reports of listeriosis have been increasing since 2002 with the highest number of cases (18 cases) being reported in 2010 (LADHH, 2015). Among the 105 listeriosis cases in Louisiana from 2002 to 2014, East Baton Rouge (EBR) and Orleans parish had the highest number of cases (LADHH, 2015). In 2013, a Louisiana company recalled approximately 20,166 pounds of cooked meat, poultry, and deli products due to possible *L. monocytogenes* contamination (USDA, 2014). *L. monocytogenes* is an environmental pathogen that is commonly found in soil and water. Animals can carry this pathogen without appearing ill and can contaminate foods of animal origin, such as meats and dairy products (CDC, 2014). *L. monocytogenes* also can be introduced into food processing facilities and persistent strains can be present in processing plants for months and years (Kathariou, 2002). Because the pathogen can enter the food chain at many and possibly even at nearly any point (Tompkin, 2002), the consumer is the last line of defense against listeriosis. To reduce the risk of listeriosis, pregnant women, as a high-risk population, have to avoid certain high-risk foods and follow good food safety practices. The purpose of this study is to assess the awareness of foodborne pathogens including *Listeria* and high-risk food consumption behavior, among pregnant women in southeastern Louisiana parishes in and around an urbanized area. The specific objectives were to describe pregnant women's 1) demographic characteristics; 2) awareness of foodborne pathogens including *Listeria*; 3) high-risk food consumption behaviors during pregnancy; and 4) to determine if relationships exist between awareness of listeriosis and selected demographic variables (age, race, education level, first-time mother) and food consumption behaviors.

2. Materials and methods

2.1. Questionnaire design

A questionnaire was designed to assess the pregnant women's awareness of foodborne pathogens and high-risk food consumption during pregnancy in southeastern Louisiana parishes in and around an urbanized area. Initial questions were developed by authors. Feedback was received from ten pregnant colleagues within the university. Grammatical corrections were made. Wording of questionnaire was modified based on the feedback. A pre-test was conducted with four students at School of Nutrition and Food Sciences, two of whom majored in Food Science while the other two majored in Nutrition Science. For each major, one undergraduate student and one graduate student were chosen for the pre-test. The average time of completion was three and half minutes. A paper format of questionnaire was determined to be acceptable.

The developed questionnaire consisted of three sections including foodborne pathogen awareness, high-risk food consumption behaviors, and demographics. A single item was developed to gauge pregnant women's awareness of *L. monocytogenes*. Answers were coded as 1 = aware of *Listeria* or 0 = not aware of *Listeria*. In the high-risk food consumption behavior section, seven high-risk foods associated with listeriosis (hot dogs, lunch meat, raw milk, raw sprouts, smoked seafood, soft cheeses, and undercooked/rare hamburgers) were identified and used to assess pregnant women's consumption of high-risk foods due to the concern of *L. monocytogenes* (CDC, 2014; FDA, 2016). Answers were coded as 1 = consume high-risk food or 0 = does not consume high-risk food. A summated score was created by summing the number of high-risk foods consumed. The possible range for scores was 0–7. Demographic questions included age, race, education, and

whether the participant is a first-time mother. Age and education level were collected using ordinal response categories (see Table 1 for response options). Additionally, respondents were asked to indicate if they were a first-time mother by checking yes or no.

2.2. Questionnaire administration

The survey was carried out at The Woman's Hospital in the city of Baton Rouge (Louisiana, USA) at the Baby Grand event on October 24, 2015. Woman's Hospital was chosen for questionnaire administration because it is the 17th largest delivery service in the United States and the largest in Louisiana who has 8,720 births annually. (Woman's, 2016). Baby grand was the biggest baby fair offered by Woman's Hospital biannually which was free and open to the general public. The questionnaire was filled out by pregnant women (over 18 years old) who reside in southeastern Louisiana parishes in and around Baton Rouge area. This study received ethical approval from the LSU AgCenter (HE15-23) and Woman's Hospital (PR-15-013) IRB boards.

2.3. Data analysis

Questionnaire responses were entered into Excel, and entry-validation checks were performed on all questionnaires by manually comparing the database and hard-copy versions.

Data were analyzed using descriptive statistics. Interval level data were summarized using means and standard deviations. Relationships among variables were assessed using rank biserial (age, race, and education level; Cureton, 1956; Gilbert & Prion, 2017) Phi coefficient (first time mother; Gilbert & Prion, 2017), and point-biserial correlation (awareness of listeriosis and food consumption behaviors; Gilbert & Prion, 2017).

3. Results and discussion

3.1. Participants characteristics

Two hundred and eighteen questionnaires were collected.

Table 1
Characteristics of participants.

	n	%
Age ^a		
<20	7	3.2
20–25	63	29.0
26–30	82	37.8
31–35	47	21.7
36–40	18	8.3
Race ^a		
African American	44	20.3
White	156	71.9
Hispanic	5	2.3
American Indian	1	0.5
Asian	10	4.6
Multiracial	1	0.5
Education ^a		
Some high school	5	2.3
High school graduate	15	6.9
Some college	52	24.0
2 year college degree	20	9.2
4 year college degree	61	28.1
Graduate degree	64	29.5
First-Time Mother ^b		
No	48	22.2
Yes	168	77.8

^a 1 person had missing data for age, race, and education.

^b 2 people had missing data for First-Time Mother.

Download English Version:

<https://daneshyari.com/en/article/5767589>

Download Persian Version:

<https://daneshyari.com/article/5767589>

[Daneshyari.com](https://daneshyari.com)