



Review

Risk communication strategies (on listeriosis) for high-risk groups

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ABSTRACT

Background: Most cases of listeriosis are domestically acquired. Although consumers have a key role in its prevention, it is generally agreed that individuals at higher risk have a low awareness of the infection.

Scope and approach: A summary of the scientific information on listeriosis awareness among high-risk groups will be presented. Reasons explaining unawareness and potential strategies to communicate with target groups in a manner that can effectively change risk behaviours reducing the burden of listeriosis will be discussed.

Key findings and conclusions: Research efforts are needed in particular experimental studies that can identify which communication factors have a causal effect on peoples' risk behaviour and how these factors influence the processing of information by consumers.

1. Introduction

Listeriosis is a rare but severe disease mainly caused by the consumption of foods contaminated with *Listeria monocytogenes*. *L. monocytogenes* is ranked as the fifth most important contributor to burden caused by foodborne illness in Europe and was the most frequent cause of death (16.2%) due to the consumption of contaminated food in 2016 (EFSA & ECDC, 2017).

The widespread distribution of *L. monocytogenes* in the environment and its ability to survive or grow in harsh conditions makes listeria difficult to control. This is of particular relevance for ready-to-eat foods that are chilled for long periods as listeria grows at refrigeration temperatures. Ready-to-eat foods such as smoked fish, deli meats and soft cheeses have been associated with cases and outbreaks of listeriosis. In recent years, outbreaks and recalls of fruits and vegetables have been increasing (Buchanan, Gorris, Hayman, Jackson & Whiting, 2017).

Healthy individuals can contract listeriosis but rarely become seriously ill. However, certain groups are particularly susceptible to infection, namely immunocompromised persons (e.g. organ transplant or cancer patients), HIV-infected individuals, pregnant women, newborn babies and the elderly. Listeria infections were most commonly reported in the age group over 64 years (EFSA & ECDC, 2017), a population that is increasing in most developed countries.

Most cases of listeriosis are domestically acquired – consumers have a key role in prevention. Education and outreach - information to help people to make decisions about whether to avoid particular foods and how to handle or prepare them to reduce risk - are key interventions to reduce exposure to *L. monocytogenes* and must be mainly targeted to susceptible individuals and to their caregivers.

2. Listeriosis awareness-the current situation

Despite several educational campaigns and media attention drawn by several deadly outbreaks and big food recalls, awareness of listeriosis among vulnerable individuals seems to be low (Bondarianzadeh, Yeatman, & Condon-Paoloni, 2007; Evans & Redmond, 2016; Mateus, Maia & Teixeira, 2014; Preußel et al., 2015).

Most of this information was collected a few years ago. As information circulates rapidly today, this may not represent the current situation. We believe that, if any, increased awareness of listeriosis or, more precisely in behaviour alterations, was not significant or otherwise the number of cases would have decreased. This is supported by the work recently published by Xu et al. (2017). Among 78.9% of pregnant women reporting that they were aware of *L. monocytogenes*, only 28.9% reported not consuming any high-risk food. To have heard the name listeria does not mean awareness of higher vulnerability,

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knowledge on the consequences or on how to prevent the infection; increased knowledge *per se* is not enough to change behaviours (Kendall et al., 2017; Wilcock, Pun, Khanona & Aung, 2004; Xu et al., 2017). Consumer safe food handling behaviours are implemented largely as unconscious and routine activities, and consumers tend to have strong confidence in their abilities (Young & Wanddell, 2016).

Evans & Redmond (2016) reported that older adults do not perceive the key listeriosis risk factors, do not associate their own domestic food practices with the potential for increasing the risks associated with this infection and do not perceive themselves to be at risk of listeriosis suggesting perceived personal invulnerability. They are confident in their abilities and this confidence usually increases with age (Young & Wanddell, 2016). Larger percentages of older adult consumers than others may deviate from recommended practices to control listeriosis in the kitchen (Evans & Redmond, 2014).

The same scenario of unawareness appears to happen with other immunocompromised persons. In a case-control study, Preußel et al. (2015) reported that 80% of non-pregnant associated listeriosis patients in Germany had never heard of listeriosis prior to their illness and only 6% of the immunocompromised control population knew about the foodborne nature of the disease. Dietary recommendations for prevention of food-borne infections do not exist for this subgroup of patients in Germany (Preußel et al., 2015).

2.1. Where can vulnerable individuals get information on listeriosis?

A huge amount of information on listeriosis can be found on the Internet and this source is often utilized for food safety education campaigns. But how effective is the informational delivered by this channel? According to Nan, Verrill, & Kima (2017), although the Internet may be an important source for general health and nutrition information, it is an uncommon source for food safety information. Authors also found that age, gender, education, and race predicted the use of different sources for food safety information. For example, Asian Americans were more likely to use Internet whereas Hispanic Americans were more likely to use interpersonal sources of information. Healthcare professionals have been identified as the preferred and trusted source to provide information on food safety (Bondarianzadeh et al., 2007; Mateus et al., 2014; Medeiros, Chen, Hillers, & Kendall, 2008). However, some studies suggested that health professionals did not always provide sufficient advice on listeriosis prevention to their patients (Bondarianzadeh et al., 2007; Buffer, Kendall, Medeiros, Schroeder & Sofos, 2013; Medeiros et al., 2008; Wong et al., 2004). Time constraints, insufficient and not up to date knowledge, lack of guidelines, limited availability of educational materials or low adherence to listeria recommendations within the health system have been mentioned by health professionals as barriers to counselling their patients (FAO & WHO, 2016; Wong et al., 2004).

Other sources of information exist, for example brochures or leaflets, and are referred as preferred sources to get information about listeriosis. Nevertheless, it can be argued that these may be not easily obtained by the target groups and the lack of regulation upon the credibility of the information presented may result in the provision of misinformation. de Gaudry, Grede, Motschall & Lins (2015) found that most brochures for pregnant women in Germany did not include literature citations and only a few gave a risk description and advertisement.

3. What needs to be improved?

From a long-term perspective, the involvement of children in food safety educational experiences may increase their awareness about behaviours to prevent foodborne diseases lifelong. Until those that are now five or ten years old reach an age to be included in a risk group requires a considerable period of time. During this period we can save lives if we can effectively communicate with those that are at risk now!

Risk communications regarding listeriosis prevention should include information and education and these must be translated into behavioral changes. Behaviours related to health are influenced by cultural factors, socio-economic and environmental as well as psychological determinants, such as knowledge, attitudes, beliefs and values. Therefore, a central challenge to effective risk communication is to identify all target audiences and understand their risk perceptions, concerns and communication needs (FAO & WHO, 2016). This is challenging when the target audiences are so heterogeneous with transient (e.g. pregnant), or prolonged susceptibility to listeriosis (e.g. AIDS patients, elderly). While, for example, pregnant women are known to seek health advice and change their diets during pregnancy to protect the foetus (Szwajcer, Hiddink, Koelen & van Woerkum, 2005), the elderly often argue that they have always practiced unsafe food handling and have never been sick, as a reason for the maintenance of their practices. The need to develop targeted food safety education is widely reported. Consumption of high-risk foods is a problem in acquiring listeriosis during pregnancy (Mateus et al., 2014; Xu et al., 2017), but for older adults greater risk factors are storage malpractices and consumption after the “best before” date (Evans & Redmond, 2016). It is also important to determine which communication channels are used and accessible to the target population. Feedback is a very important issue in health communication.

Being a commonly trusted source of information, health professionals need to develop listening skills to create trust in patients, need to communicate also empathy and caring, and should recognize patients' concerns and emotions. This would allow identifying where knowledge gaps/barriers to communication exist between scientific experts and patients, and for sure would motivate patients to act (FAO & WHO, 2016). But it appears that health professionals also need to be aware of the importance of listeriosis and more information, tools and training in order to communicate and involve patients in a manner to achieve the behaviour change are needed (Buffer et al., 2013; Wong et al., 2004).

Other sources for communication need to be explored. Reading labels on foods is a common behaviour during shopping. According to Mikulsen & Diduck (2013) food safety messages could be provided in the food packaging. Social media, online courses, smartphone applications, cookbooks are other opportunities. Continued research efforts are needed, in particular experimental studies that can identify which communication factors have a causal effect on peoples risk behaviour and how these factors influence the processing of information by consumers.

Although there has been much research into consumers' attitudes and knowledge (Wilcock, Pun, Khanona & Aung, 2004) there has been little work on the effectiveness of food safety education interventions on high-risk populations (Sivaramalingam et al., 2015) and on investigating the barriers preventing high-risk populations from carrying out best practices (Young & Wanddell, 2016). Here is a great opportunity for transdisciplinary research combining the natural and the social sciences.

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