LISTERIA A DEADLY FOOD POISON: INDISCREET BEHAVIOR OF ITS AWARENESS AMONG DIFFERENT ECONOMICAL CLASS IN PAKISTAN

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Abstract
As this article is survey based to investigate the awareness about “Listeria food poisoning” in different economical classes. For this survey, different questions are asked by people to evaluate the result about Awareness of Listeria. Listeria is a bacteria which is found in contaminated food and transmitted by human to human except in case from mother to fetus and this bacteria causes infection called Listeriosis or food poisoning which include mainly vomiting, diarrhea, fatigue and illness. Listeria was first isolated from an infected soldier in 1918. It is mostly found in freezed, chilled and raw food. This infection can be deadly and less people are aware of it in different economical classes. This study main aim is to find the awareness about Listeria food poisoning in public and what they do management when they suffer from it. By observing some information from different class people draw out that The middle class people are very aware of it that is 71% then high class is of 40% and low class is of 23%. And mostly 95% people from middle class concern with doctor, and low class 60% go with some home remedies and 25% high class also go with home remedies instead of doctor. These results are amazing, as mostly thought that may high class people mostly knowledgeable and aware with it but people belong with middle standard are mostly more qualified and are being aware with Listeria food poison.

Keywords: Food poisoning, consequences, listeria, pathogenesis, prevalence.

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Available online: www.ijipsr.com September Issue 1227
INTRODUCTION

Listeria is a genus of bacteria that contains ten species [1,2]. It was named after the name of English pioneer of sterile surgery ‘Joseph Lister’. Listeria are gram positive, rod-shaped, facultative anaerobic and non-spore forming bacteria [3]. The first case of listeria was observed in 1924. It was identified by two researchers in 1920’s from animal outbreaks. They belong to the family Corynebacteriaceae [4]. Their flagella are produced at room temperature but not at 37°C. They are found in soil, so cause vegetable contamination. Mostly found in uncooked food, vegetables, fruits. They are responsible for listeriosis (lethal food borne illness) [5,6,7]. Listeria is also known as Listeria monocytogenes. They cause gastroenteritis because they are food borne pathogen and this disease can further develop into severe invasive illness in elderly, pregnant women and infants too [1]. As these pathogens are found in food processing plants and preferably grows at refrigeration temperature so these are threat for contamination of ready to eat food [2]. Recently, in 2011, these pathogens contaminated cantaloupes were the cause of sickening of 147 individuals and responsible for 33 deaths [2]. To contaminate the food supplies, these pathogens adhere to multiple biotic and abiotic surfaces [3]. Biofilms are structural communities of bacterial cells that can easily adhere or transfer to an inert or living surfaces [4]. The hallmark of biofilm formation is extracellular polymeric substances [5,6]. These biofilms helps the bacteria to be attached easily to glass, plastic, steel etc [3,7]. Hence, these pathogens are very lethal to humans as well as for animals and cause several kind of diseases like food poisoning etc. The incubation period of listeriosis is vary from disease to disease. The longer incubation period is observed during pregnancy i.e. 27 days while the shortest incubation period is observed in gastroenteritis i.e. one day. In CNS case the duration of incubation is 9 days and for bacteremia is 2 days [8]. The incubation period for listeria gastroenteritis is shorter than that of invasive listeriosis [9]. The incubation period for invasive listeriosis is 35 days [10].

Pathogenesis: Internalin A and Internalin B, the cell wall adhesion proteins, bind to the host cell membrane receptor E-cadherin and Met. The phagocytic vacuole enters the cytoplasm and get lysis by the phagolysosome i.e. listeriolysin O (produced by bacterium) and allow that vacuole to enter the host cytoplasm [11]. Act A initiate actin formation [12] which allow the bacterium to propel to the cell membrane and create filopids (the projection of cell membrane). Nearby cell ingest these filopids so that bacterium enters the cytosol of new cell. Therefore listeria avoids antibodies, complement or neutrophils of host cell. Immunity against listeria is primarily cell
mediated [12]. The Listeriosis sign and symptoms are difficult to judge it is due to Listeriosis symptoms are very much same like illness caused by flu or gastroenteritis. Primary symptoms of Listeriosis infection include some symptoms of flu: fever, cramps, vomiting, diarrhea and nausea. Whereas, some symptoms are rare or unique that has to pay attention by physicians like Meningitis, immuno-suppression [13]. Listeriosis is due to either contaminated food with Listeria monocytogenes or some sporadic cases. Some conditions are also related with listeriosis like meningitis, diabetes mellitus, suppression of immunity, alcoholic individual, pregnancy, renal associated diseases, and cardiovascular diseases. Listericosis usually occur in, adults, neonatal , older than 60 and pregnant women and immuno-suppressed patients ( like cancer, AIDS , HIV , patients taking guco-corticoids , transplanted patients because they take inhibitors of tumour necrosis though which immune system goes to weakened, these are at high risk. [13]).

Listericosis in adult have symptoms of primary bacterial (like nausea, vomiting, diarrhea, fever and cramps) and may include inflammation of endocardium means endocarditis. However, sporadic cases includes prosthetic valve endocarditis, peritoneum defects, prosthetic hip infection , meningitis etc (table 3 page 479) [14]. This Listeria monocytogenes , in leukemia patients it cause brain abscesses and in immune-compromised patients it cause mostly Meningitis and Listeria monocytogenes also cause central nervous system infection which may include meningitis with some symptoms like malaise(feeling of discomfort and illness) , headache , fever and vomiting. According one report in 1989, it states that after survey in different countries , in 16 countries report said that in total cases of Listeriosis 31% cases seen in older than 60 individuals and 22% reported for babies less than 1 month means this report shows that neonates and older than 60 individuals are at high risk than others. [14]. The Listeriosis which is caused by intake of contaminated food suffer from moderate to mild sign and symptoms. The question arises why Listericosis is not developed in healthy adults because they release tumour necrosis process through which activate macrophages and monocyes whish further eradicate the organism. [13]. Neonatal Listericosis or listeriosis in pregnancy have only symptoms like flu means mild and not having such very rare symptoms like cramps or diarrhea or pain in back in lower side. Maternal listeriosis is cause by 3rd trimester late abortion in pregnancy, cases also reported for 1st and 2nd trimester. [14]. Pregnant women is at more risk than healthy women and at risk of unplanned abortion. Newborn individuals have two types of listeriosis one is Early onset infection, which is occur in less than a 7 day baby and it is diagnosed with sepsis in 24 hours of life of organism and this Early type infection is by transplacental transmission from
mother & other is Late onset infection that causes complications after birth it not well discovered. Listeria organism is not widen by breast feeding. Nonperinatal Listeriosis means listeriosis not associated with before and after birth have mostly two conditions: one is Septicemia which is about 25% and second is Meningitis which is about 33%. Listeriosis symptoms usually shows after ingestion of contaminated food with Listeria monocytogenes in period of 2 –70 days but this period is not for mother to fetus listeria transmission [13]. Listeria monocytogenes is a facultative anaerobic bacterium. In humans this pathogen is responsible for different infection usually food borne infection and can be transmitted by contaminated food and raw food for example: raw milk. Inside host cell it can develop and replicate and responsible of, to spread very quickly and undesirably and harmfully to cause a disease in living animal species such as farm ruminants (sheep, goat and cattle). In 1999, there is 2500 cases of clinical human listeriosis. In United States, respectively year, 500 deaths are caused by the infection of Listeria. Animal desired food products which are also contaminated by Listeria monocytogenes that are raw milk, butter, soft cheese, processed meat , and poultry products have been compromised as origin of human Listeriosis. The Listeria bacterium cause human infection by contamination of ready to eat food products, responsible for contamination of finished product from the food processing plant environment, animals that are infected and contaminated agricultural environment food product that obtained from animals. If that are not processed before used example raw milk and raw food that oriented from plant have been contaminated mainly by the infected animal have relation between human infection and listeria monocytogenes in farm animal and farm environment. [15]. Listerial infection can only be diagnosed by culturing the blood sample, amniotic fluid or spinal fluid. In diagnosis of listerial infection, vaginal or stool cultures can’t be helpful because some women don’t have clinical disease they are carriers. In 33% of cases Gram stain is helpful. Listeria bacteria is resemble to pneumococci (diplococci), diptheriods (corynbacteria) or haemophilus species hance its diagnosis is difficult , can be improved to inform the microbiologist suspicion of listerial infection.[16]. Healthy people who have listeria poisoning does not require medical treatmen t, supportive care can treat illness [17-20].Patients with compromised immune systems, pregnant women, and newborn babies are at risk for severe symptoms such as high fever, stool culture are usually treated with antibiotics such as ampicillin, penmicillin G (Bicillin L-A), trimethoprim-sulfamethoxazole (Bactrim, Septra).Generally, the length of antibiotic treatment increases with the severity of the infection. Patients who are severely ill or who show signs of Listeria meningitis will require
hospitalization and intravenous antibiotic treatment [17,20]. The majority of people with Listerial infections spontaneously clear the infection in about seven days. However, those patients at increased risk, especially pregnant women, usually require immediate IV antibiotic treatment to prevent, halt, or slow the development of more severe disease. For example, early effective antibiotic treatment of pregnant females may be lifesaving for the fetus [20,21].

Our main aim of study or survey is to know the awareness about listeria food poisoning among different economical backgrounds. To determine that how many people are aware about that listeria (a bacteria or parasite) can cause food poisoning and it is deadly.

**METHODOLOGY**

Initially, sample were select from different economical backgrounds peoples i.e low, medium and high class peoples (n=100) which is comprised of 30% from Low class, 30% from medium and 30% from high class respectively to evaluate peoples in survey to check that which class is more aware about listeria food poisoning. Different questions were asked from peoples about their health hygiene, quality of food, food poisoning, listeria, knowledge about treatment protocol with their life style modification which they use to treat food poisoning and did they know that listeria is deadly or not. At last, by taking survey from different economical backgrounds people, data interpretated from results and compared these results graphically with different parameters and in tables.

**RESULT**

As we done completely this awareness survey about “Listeria food poisoning” in different economical classes. We have found very amazing results that are drawn out by observing and doing surveys with different economical class people. As this study concern with three classes of high, middle and low class belonging people. We evaluate that Middle class people are very much aware about listeria according to study and research 16% of low class belongings, 33% of middle class belongings and 11% of high class are knowledgeable to Listeria pathogen [as shown in fig : 2] and About 23% in low class, 71% in middle class and 40% in high class people aware with “Listeria food poisoning” [as shown in fig : 1] and now how much population in different economical classes are known that Listerialosis can be deadly this study evaluate that 61% in low class, 83% in middle class and 55% in high class people know that Listerialosis can be Deadly [as shown in fig 3] last observation in study is that how much people consider to concern a doctor as first choice [according to fig : 4] 40% in low class, 95% in middle class and 75%. As the whole
result review shows that Middle class belongings are more knowledgeable to listeria and listeriosis and much more qualified than other 2 classes.

**STATISTICS**

For intense talk about all three economical classes so mostly very less people are known about Listeria food poisoning, most of them are aware with food poisoning but not with Listeria but when we done the whole survey we elute out that as compare to high and low class mostly Middle class belongings are aware with listeria food poisoning and they also know that Listeria is a bacteria which is found in contaminated food & low class belongings are very much less aware with both Listeria food poisoning and Listeria.[figure 1]

![Fig.1: give information about “Awareness about “Listeria food poisoning” among different classes of people](image)

As discuss above here is the same result, Middle class belongings also know that Listeria is a bacteria which is found in contaminated food instead that high class are approximately not known with Listeria and many low class are also not known with listeria this result as because Middle class are more qualified than other 2 classes.[fig 2]

![Fig.2: give information about “Awareness about “Listeria pathogenesis” among different classes of people](image)
This statistics are also in favour to Middle class they eventually know that Listeria food poisoning can cause death as compare to high class and low class that some individuals like 50% in population know that. [fig 3].

Fig.3: give information about “Awareness about its deadliness through Listeriosis” among different classes of people

As Middle class belongings know that listeria food poisoning can be deadly hence approximately all population in middle class believe to concern with a doctor where as in low class belongings approximately 60% believe in such home remedies like beverages, lemon juice, chorans, hajmola type things and high class also believe to concern with a doctor except less individuals and families which go through with home remedies. These all results are depend on education and illiteracy rate.

Fig.4: give information about “Treatment among different economical classes that is to concern the Doctor (Remaining believe in some sort of home remedies)” among different classes of people
DISCUSSION

As the article is on awareness survey about “Listeria food poisoning” in different economical classes hence the basic purpose of this study is to perceive that how many people from different economical classes are aware with Listeriosis in society. Listeria is a monocytogenes bacterium, the reason for Listeriosis which is a food poisoning disorder caused by contaminated food with Listeria. Listeria principally cause affect pregnant women, newborns, the elderly and adults with impede immune system. Often healthy adults and children are also being infected with Listeria monocytogenes but they will almost never seriously ill. If the mother is getting contaminated food with Listeria during pregnancy then there is a chance that baby may be born with Listeriosis. If you are pregnant and get Listeriosis so antibiotic can often prevent infection of fetus or new born.

There is also another source of this infection except contaminated that is ready-to-eat food because this pathogen are also found in food processing plants and can grows in refrigeration temperature. Some conditions are also related with listeriosis like meningitis, diabetes mellitus, suppression of immunity, alcoholic individual, pregnancy, renal associated diseases, cardiovascular diseases. Listeriosis usually occur in, adults, neonatal, older than 60 and pregnant women and immuno-suppressed patients (like cancer, AIDS, HIV, patients taking glucocorticoids, transplanted patients because they take inhibitors of tumour necrosis though which immune system goes to weakened, these are at high risk. Listeria can also cause gastroenteritis which can further lead to invasive conditions. Why Listeria not infected to persons with strongly developed immunity because they can assemble tumor necrosis though which generate monocytes and macrophages that terminate this pathogen. Listeriosis symptoms are tough to acclaim because it is correlative with the flu symptoms. Firstly infected patient feel primary bacterial indications that is fever, cramps, nausea and vomiting then severely observed meningitis, septicemia, and immune suppression. Meningitis is the main manifestation of Listeriosis. Listeria can only be diagnosed by culturing blood sample, amniotic or spinal fluid. If anyone get infected with Listeria must concern with doctor as far as it turn into invasive condition. The treatment of this infection is the antibiotics and patient will take over this condition and symptoms within 7 days. The invasive condition of Listeriosis give IV antibiotics for fast onset. Generally, the length of antibiotic treatment increases with the severity of the infection. The condition turn to invasive, reason is that not concern with a doctor or not get treated, or some where people also consider some home remedies or use medications by own.
This study or survey manifest that most of the people are being aware with food poison but not familiar with Listeria. Infact people of low class even were also enlightened with that food poison will be death causing but they don’t have perception of Listeria. Basic reason behind this issue is chiefly illiteracy in society in every class among people further more reasons are less counseling and rarely held informative programs concerning to medical issues and their transmissions from Government and Medical associated centers and people also don’t want be knowledgeable. People should be aware with this infection as it is Deadly either they belong to any economical class, it is the matter of their lives but this survey results amazingly change the views, as thought that high class people are more aware about Listeriosis as they are health conscious but the evaluated result is that even most of them are not known with Listeria food poisoning but the people concern to high class may not be knowledgeable but health conscious in manner that more than half of them is first choice after observing very mild symptoms to concern to a doctor and the result also shows that Middle class belongings are have high percentage to aware with Listeria and its food poisoning and its deadly fact and their first choice is to concern with a doctor and they are very much more qualified than low and high class and hence this show why they aware more with “Listeria food poisoning” and health hygiene. Instead of this, low class have some percentage of people more than high class that believe their home remedies like cold drink, green tea, mint, chorans, lemon juice, omit it out etc but they don’t know it is very risky their first choice must be to concern with a doctor.

CONCLUSION

Listeria is a bacteria which is found in contaminated food and transmitted by human to human except in case from mother to fetus and this bacteria causes infection called Listeriosis & it is DEADLY considered. Government should do such awareness programs that all economical belongings should aware with it and should know that it is deadly so do right management (treatment). We concluded that as overall “Listeria food poisoning” awareness is very less and mostly people management style is very rare like with some sort of chorans and with beverages & among low, middle and high class belongings the people concern with middle class are more qualified and aware with listeria and Listeria food poisoning and their treatment option is to concern with a doctor mostly as they know that Listeria food poisoning is deadly among low and high class. This result is a amazing surprise for as we thought before survey that high class people
mostly aware with this and they may be more health hygienic conscious but this result turns our thoughts.

REFERENCES


Available online: www.ijipsr.com September Issue


