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Hemolytic uremic syndrome in Argentina: An attack scenario

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PEER REVIEW

Peer reviewer

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Comments

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ABSTRACT

The recent *Escherichia coli* epidemic in Germany gave a lesson at an international level. There is no time to solve food security problems when an epidemic is on the way. The epidemic in Germany exposed the fissures in the control systems of the Federal Risk Evaluation Institute of this country, as well as showing the incompetency of health authorities, who had great difficulty in resolving the situation. To summarize, the possibility of prevention was confused with the utopian idea of non-occurrence. It was not less important the public's recognition and the "awakening" of health ministers in the European Union as regards the proven fact that pathogenic and even lethal microorganisms may be present in the food we eat. Argentina has the highest incidence of hemolytic uremic syndrome in the world, and the next epidemic is likely not to occur in Germany, but in any other country, such as Argentina. In order to avoid complicity, we do not wish to remain silent about the situation in Argentina. Therefore, this is the writer's motive for writing this article, which describes the scientific advances and the ethical pitfalls related to a disease transmitted by food, particularly hemolytic uremic syndrome, in Argentina.

KEYWORDS

Hemolytic uremic syndrome, Fooodborne diseases, Epidemiological surveillance, *E. coli* O_{157}:H_7

1. Introduction

The epidemiological surveillance systems have been oriented almost exclusively towards detecting certain illnesses to allow a fast control intervention, especially in transmissible pathologies. In many countries, these systems have become passive case notification mechanisms, characterized by data collection at peripheral levels, followed by their data collection at central levels (OPS, 1984). The foregoing article analyses the epidemiological surveillance system used for the hemolytic uremic syndrome (HUS), a disease transmitted by food which mostly affects 5-year-old children[1]. Particularly, the data collection instruments are identified, a map is drawn explaining the operation of the surveillance for the HUS, and its faults are detected. The surveillance system analysis is approached from a critical perspective of the theoretic-political model that sustains this kind of traditional surveillance, which is still used in Argentina almost without any questions being asked, except for those which are expressed as technical failures during the implementation process[2].

2. Epidemiological surveillance

"Epidemiological surveillance" is established by the opportune, systematic and periodical use of facts, with the aim of getting to know the illnesses distribution and the factors which directly or indirectly affect human or

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animal health. Surveillance is the constant and systematic collection, analysis, interpretation and diffusion of specific data about health-sickness events in a population, in order to use them in the planning, execution and evaluation of public health policies. The data is also analyzed for later action, and its goal is to obtain updated and suitable information to offer technical guidance for those who have the responsibility to determine the prevention and control policies[3].

In the year 2000, the Argentine Ministry of Health established an obligatory notification about the HUS on a weekly basis to the National Epidemiological Surveillance System. The surveillance employed is of a passive nature, which means that the data collection starts in hospitals where cases are admitted. This information is loaded on a chart which contains variables of a demographic nature, for instance, personal identification, place of residence, date on which symptoms started. Afterwards, the data is loaded to a node on the Internet[2].

There are 600 nodes in the country, connected to a national web. In the year 2004, it was proposed the implementation of a Laboratory Surveillance System, which consists in notifying this pathology through a different set of routes: if a patient with bloody diarrhea is admitted, when the sample is identified as being caused by a disease transmitted by food, or as a result of HUS, the notification is carried out[4]. In 2005, 24 sentinel units were installed for HUS surveillance, which started working in pediatric hospitals in jurisdictions with the highest incidence rates. Thus, the data for epidemiological surveillance of HUS is originated from three sub-systems: weekly passive notification in a form, the sentinel units, and the sub-system based on laboratory diagnoses[1].

3. Discussion

The organization of the epidemiological surveillance system for HUS is relatively complex. While information is being collected, different problems with which the system struggles daily emerge. These faults are considered by epidemiologists and health care workers as being essentially technical, with certainty that if certain adjustments are carried out, the system would function at its optimal level[5]. In the first place, it starts from the idea that information is a key element for taking a decision. If information is kept secret, political decisions surely will not reach their goals. Every policy follows a logical form (techniques, procedures, devices, rules) in which government decisions are materialized and made operative. But the techniques and instruments are full of ideology and social interpretations of regulatory modes[6]. Therefore, when policies are analyzed, the instruments used must be critically considered, since different instruments correspond to different political relationships, state roles and degrees of lawfulness. If tecniques and prodedures are thought from the point of view of instrumental reason, the subject (his or her interests, conflicts, positions, problems, *etc.*) is forgotten, or rather, denied. Therefore, the challenge is to divert from thinking how to implement a certain policy to thinking why that intervention mode is selected. Thinking why any given policy is carried out immediately includes the subjects and their positions, interpretations, knowledge and practices in the analysis[1].

HUS surveillance reveals conflict knots which permanently appear in health care worker's reports. These faults might be justified by the fact that the mandatory notification of the syndrome and its corresponding surveillance are of recent application, meaning that the system is still taking its first steps.

However, when the failure analysis is looked at in greater depth, it becomes clear that they are not exclusive to this particular case, but, in fact, they are representative of the problems of every surveillance and information registry system at a national level[7]. The difficulties detected set problems of diverse nature: delays or non-compliance with immediate notification when a case appears in the health service and/or superior levels of decision-making; lack of resources in laboratories to carry out diagnoses; connectivity problems; non-compliance with present rules; faults at the beginning of an investigation of the epidemiological links[8].

Specifically, the National Reference Center works more as a primary diagnosis laboratory than as a national reference one to which samples should arrive to be confirmed. Therefore, this is how duties interfere in the different components of sentinel surveillance. On the other hand, the data collection covers only a part of the population, mostly those seen in public services. This fact emerged on many occasions from cases that appeared in private hospitals and which were not notified to the surveillance system, despite the fact that resolution 346 imposes its mandatory nature to all health care systems[4]. In 2007, a 3-year-old boy, victim of HUS, generated a heated mass media debate in Argentina. The child, who passed away a few days after being admitted, was treated in a private hospital. His case was not notified to the surveillance system. The response of the private entity was: "the clinic understands that it is not mandatory to speak about what does not contribute to the case or to the inhabitants of the city, since notification is merely an administrative matter"[7]. The verticality of the system, occasionally, generates apathy in health care professionals and epidemiologists of initial and middle links. The lack of any reply to the information analyzed causes disheartening in health care workers. For example, a professional of the Food Microbiology Laboratory realizes about this reality when curiosity is compared with a positive sample. Interest arises from the desire to know the way followed by that sample once it abandoned the microscope in his laboratory and continued to a destination completely alien to his field of action. Subjects, thus, lose sight of the work process in

its entirety, just as workers in a Fordist type production line do, with consequences not completely different from those of the latter[3].

The information collected by the National Reference Center is not the subject of analysis at a health care services level or middle links; rather, it is raised directly to the superior level of decision-making. Thus, the national level is the recipient of local data which is then processed and published as aggregates that are shown in different statistics charts without taking into account the differences that exist at a geographic and social level[5]. Epidemiological investigation is restricted only to clinical and laboratorial areas, with scant attention being paid to population studies and the improvement of services, which are fundamental elements when deciding which policies are the most adequate to implement at a national level and even to reflect (or not) the necessity of differential policies. Another critical element that emerges in part of the scientific community is that the surveillance system has "pigeonholed" itself to the detection of strain *E. coli* O_{157}:H_7, leaving aside other non-O_{157}:H_7 strains of *E. coli*[6]. When we talk about non-O_{157}:H7 strains, we are referring to the universe which does not enter into that classification. As strain O_{157}:H_7 is legislated, it enters into search parameters, while other strains, which are not legislated and have no validated techniques for their detection, do not. It is considered that in Argentina approximately 40% of HUS cases are caused by strain O_{157}:H_7, but the rest are caused by other strains which are commonly called non-O_{157}:H_7 (the rest of the universe). In either case, in Argentina there is a prevalence of the most toxic genotypes known in the world[7].

For decades, the register in Argentina has been a problem, due to multiple forms, different support systems, under-registration, problems in reliability, difficult access, private appropriation of public data, lack of analysis of facts, especially at a local level, no return of processed information to those responsible for generating the primary data, among others. The sequence facts, information, knowledge and decision is broken, or rather, was hardly ever able to be linked as such, with each level remaining as an independent circle with little or no inter-relation[2].

The problems found in this case do not escape those which subsist in the entire system for the registration of national data and the implemented surveillance systems for other pathologies. It seems that these enormous faults are an "almost natural" fact in Argentina. Therefore, why are its faults analyzed as if they were specific to the strategy applied for the control of a particular disease? Wouldn't it is better to start thinking from a point of view that is different from the one of instrumental logic[8]? Foodborne diseases are one of the major threats to public health. This happens because of the presence of pathogenic microorganisms in any raw food, mainly in fresh fruits and vegetables, dairy products and meat. In order to reduce the diseases related to the consumption of these foods, it is necessary to have the collaboration of the official organizations that are in charge of the population' health care, of the food industry, health institutions and consumers. There is no doubt that the surveillance of the food contamination requires a many-sided view, which includes all the entities involved in the food chain, from the farm to the table. Moreover, a properly coordinated strategy is required, in which all the control organisms that are in charge of the foods' harmlessness and safety are present[1].

In the industrialized countries, the current situation has brought up consumer's doubts regarding the foods' harmlessness, as well as distrust of the existing food control systems. As a consequence, it is urgent to demand the health ministers a strong political will to make efforts in order to guarantee the foods' harmlessness[5]. Even though it is known only partially, the morbidity hidden effect and the current data are, in fact, alarming. Just by analysing what is happening and the uncertainty, we can realise that once the diseases is acquired, one does not know whom to pray to. As regards this, it is worth highlighting that in the underdeveloped countries the foodborne diseases effect is clear and endemic[3].

This unfortunately happens because of the consumers' lack of awareness as well as because of the politicians' carelessness, as there is usually little political willingness to properly deal with these matters, which means correctly doing the correct thing. The gap between developed and underdeveloped countries is not only economical; it is mainly intellectual and moral[6]. The people like me, who have zero tolerance to apathy and indifference, want things to be different. The setting up of alliances between industrialized countries and developing countries will allow us to benefit from the previous and current experiences with the aim of promoting the foods' harmlessness at a national and international level[7]. The aim of this review is to use this opportunity to work seeking for the safest foods for everyone, as well as to pass on my own experiences and my colleagues' experiences, which come from the thorough study of specialized publications. As regards this, this book has follows these steps: 1) I analyzed what I know, 2) I looked for gaps in knowledge, 3) I criticised stated commitments, claiming and demanding rigor in the health authorities from the countries that often, if not always, have a special system to hide the problems in public health by pretending that such problems do not exist, and 4) I paid attention to inconsistency and contradictions, as well as to the shown conclusions[8].

This is the great merit of this book, but it also has its limit. One doesn't write to be read. How can one give vitality to each of these chapters, each with its own "atomic weight" if there are no readers, the ones who are destined to decode the symbols[3]? One writes for this, and only for this; not to amaze or to have "success", because if a book belongs of the ones who remain, the aim is achieved and the author can be "deleted". I hope that the teachings I want

to transmit are so simple that everyone may be pleased because they completely understand them[5]. In short, I do not consider that the researches about diseases related to foods are finished, and this book shows my wish to go on reflecting on and setting up new ideas, while some others pay attention to this problem. A discerning palate is not necessary to notice that avoiding this difficult project would be equivalent to assuming the responsibility of cutting short a work continuity that constantly points at the future.

Conflict of interest statement

We declare that we have no conflict of interest.

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Comments

Background

E. coli O_{157}:H_7 was first recognized as a human pathogen following two hemorrhagic colitis outbreaks in 1982 (Riley *et al.*, 1983). The first outbreak, with 26 cases of which 19 were hospitalized, occurred in Oregon, and the second, with 21 cases and 14 hospitalizations, followed three months later in Michigan. Undercooked hamburgers from the same fast food restaurant chain were identified as the vehicle, and *E. coli* O_{157}:H_7 was isolated from patients and a frozen ground beef patty.

Research frontiers

It is apparent that microbiologists, molecular biologists, and food scientists have made great strides in understanding *E. coli* O_{157}:H_7 and developing means for controlling them in foods. It is also evident, however, that there are major scientific questions that must be answered before we will be able to fully assess and manage public health concerns associated with their foodborne transmission. Addressing these questions will require the continued effort and support of basic and applied scientists from a variety of disciplines.

Related reports

Alcides Troncoso in "*E. coli* O_{157}:H_7 infections and HUS: the missing link", provides the essential information on the microbiology of food. The association of human pathogens with outbreaks of foodborne diseases and a perspective on the microbiology safe of food are presented (Lambert Academic Publishing, 2012).

Innovations and breakthroughs

Continued vigilance and the ability to rapidly mobilize research capabilities must be an integral part of food safety programs if we are going to minimize the impact of new foodborne microbial threats to human health.

Applications

This article teaches us about an incredible opportunity we have to control foodborne diseases on a massive scale. We cannot take for granted that foods and food practices that have been traditionally safe will remain that way in the future.

Peer review

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