From tasteful treats to tainted tables: Unveiling food-water borne outbreak at a girls' boarding school in Kelantan

Ahmad Zulfahmi Sha'ari[1], Hazlienor Mohd Hatta[1], Nik Mohd Hafiz Mohd Fuzi[1], Sharina Dir[2]

[1]Communicable Disease Control Unit, Disease Control Branch, Kelantan State Health Department, Kelantan, Malaysia, [2]Kota Bharu District Health Office, Kota Bharu, Kelantan, Malaysia

ABSTRACT

Introduction: Investigating the source of food and waterborne outbreaks poses significant challenges due to its complex nature, with diverse pathogens and a wide range of symptoms. This report presents an investigation into a recent food poisoning outbreak that occurred in an all-girls semi-boarding school with multiple contamination sources. To describe the outbreak's epidemiological characteristics, identify risk factors and the outbreak source, and detail the implemented control and preventive measures. **Materials and Methods:** Active and passive case detection, interviews, record reviews, laboratory and environmental investigation were executed. A case-control study was conducted involving individuals who had eaten in the school facilities within the incubation period or those who epidemiologically-link. The case was defined as individuals who experience one or more symptoms of stomach-ache, diarrhoea, dizziness, nausea, and vomiting, or fever. The asymptomatic control group was matched in a 1:2 ratio. Demographic data and three days' food history were digitally collected using an online form and were transferred to a spreadsheet template with statistical calculators. Descriptive data were analysed and the odd ratio for each food/water consumed was calculated. A Hazard Analysis and Critical Control Point (HACCP) was employed to identify critical control points. **Results:** A total of 34 cases were reported out of 1,931 individuals exposed, with an attack rate of 1.8%. All of them were students aged 13-17 years old and 70.6% (24) were boarding students and the rest were day students. Symptoms primarily included abdominal pain (94%) and diarrhoea (74%), with additional reports of nausea (44%), dizziness (44%), vomiting (24%), and fever (9%). The epidemiological curve displayed irregular patterns with multiple peaks, indicating multiple sources and an incubation period ranging from 3 to 44 hours. Prompt case-control analysis identified potential causative foods served in the school canteen over two days: tom yam fried rice (OR: 6.41, 95% CI: 2.012, 20.411), red chicken rice (OR: 4.93, 95% CI: 1.944, 12.499), and tom yam noodles (OR: 4.58, 95% CI: 1.503, 13.974). The suspected contamination was traced back to raw chicken, with Salmonella species as the likely agent. The HACCP analysis identified improper storage and thawing of chicken, and suboptimal cooking processes, as the main risk factors. Salmonella species were isolated from leftover raw chicken samples. The premises were temporarily closed, and comprehensive health education was provided to students and food handlers. **Conclusion:** This investigation emphasizes the significance of a well-coordinated and timely response, supported by digital advancements, in pinpointing the origins of food poisoning outbreaks, implementing suitable control measures, and providing education to those affected. Such measures are crucial in ensuring the health and safety of the affected population and preventing similar incidents in the future.