Implementation of the Hazard Analysis and Critical Control Point (HACCP) System of an Enteral Feeding System at a Private Local Hospital in Taichung of Taiwan

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ABSTRACT

Enteral feeding system is one of the important therapeutic tools to prevent malnutrition for hospitalized patients. The microbiological index, including total plate count (TPC), coliform, E. coli, Salmonella spp., and Staphylococcus aureus, of an enteral feeding system at a district hospital in central Taiwan was evaluated. The elements of food, food residues in the feeding containers, feeding containers, luer connectors, feeding operators’ hands, and working area surfaces were evaluated. A hazard analysis and critical control point system (HACCP) was applied. Various critical control points related to the sanitary conditions were selected and the corresponding corrective actions were taken. The microbial counts of the majority of the samples were significantly reduced. The luer connectors were noted in particular. The microbial counts of TPC, coliform, and E. coli of the luer connectors were 6.95, 5.32 and 4.84 log CFU/mL, respectively. After HACCP implementation, the microbial counts were significantly reduced to 1.52, 0.24 and 0.24 log CFU/mL, respectively. The positive detection percentage of Salmonella spp. and S. aureus of the luer connectors was reduced from 100 and 61% to 0 and 16%, respectively. Similar reduction of microbial count could also be observed in other samples. This study implies that proper monitor and corresponding corrective actions could be used to improve the microbial quality of an enteral feeding system in hospitals.

Key words: Hazard Analysis and Critical Control Point, enteral feeding system, microbiological analysis

INTRODUCTION

The enteral feeding system is used for nutritional support in patients with head injuries, cancers, AIDS and other diseases (1-5). Contamination of enteral feeding solutions and infectious complications in patients included septicemia, bacteraemia, diarrhea, salmonellosis, and pneumonia (6,7).

A number of studies have shown the importance of appropriate handling procedures and the design of enteral feeding systems in reducing the risk of microbial contamination of the enteral tube feeds (8-10). The Hazard Analysis Critical Control Point (HACCP) is a system based on the prevention of problems associated with food safety and is now widely used, especially in the food industry, as the most effective way of controlling food poisoning and food-borne diseases (7,11).

Since 1978, the HACCP approach has been applied to food service system in hospital (12). The main studies of the HACCP system focused on food service systems included breast milk (13,14), entrée production, fresh and frozen foods (15), sandwiches (16), food handlers (17-19) and enteral feeding (20-22) in hospitals. In Taiwan, many hospitals use commercially ready-to-use foods to reduce contamination. However, microbial contamination is still a problem. Hence, the purpose of the present study was to investigate the microbiological condition of enteral feeds for patients before and after implementation of the HACCP system in a clinical system.