ROLE OF TASK FORCE COMMITTEE IN HOSPITAL INFECTION CONTROL DURING EPIDEMICS AND PANDEMICS

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ABSTRACT:

Pandemics are defined as large- scale outbreaks that can greatly increase mortality and morbidity over a wide geographic area and cause significant economic, political and social disruption due to spread of infectious disease. Risk of pandemic and epidemic conditions have occurred throughout history and appear to be increasing in frequency, particularly because of the increasing emergence of viral disease from animals. Other associated risk factors include older age, longer hospital stays, immunosuppression, frequent encounters with healthcare facilities, mechanical ventilatory support, multiple underlying chronic illnesses, recent invasive procedures, indwelling devices and being in a critical care unit. Management of acute infections transmitted to susceptible patients via cross infections and emergence of antimicrobial-resistant pathogens need attention in a hospital set-up. Task forces committee are organisations of small groups of resources and people brought together to establish a specific objective, to complete the expectation that the group will disband when the objective has been completed. The task force committee is actively involved in resolving issues on hospital acquired infection during pandemic and epidemic outbreak of disease and this review underpins the same.

KEYWORDS: epidemic, pandemics, hospital acquired infection, task force committee.

INTRODUCTION:

Task forces are work groups typically comprising experts in specified areas of knowledge or practice (Osterhaus and Albert D M, 2007). Task forces committees (TFC) are organisations of small groups of resources and people brought together to establish a specific objective, to complete the expectation that the group will disband when the objective has been completed (Smith, Bower and Aritua, 2010). Whereas committees are typically defined in organizational by-laws, charters, or other formal documents, task forces are created on an “as needed” basis (Pfeffer and Sutton, 1999). The impetus for the creation of a task force is often the result of some event, often unexpected or unanticipated, causing the need for an organization to acquire knowledge as to how to best respond to the event, related events, or to a similar situation (Drucker, 2018). One of the major differences between the task forces and committees is based on the assignment of resources and forces. It is based on the material and personnel which is required to enhance the chance for immediate success of the task force and are put to work simultaneously (Priyadharsini *et al.*, 2018b). Task force committee work results are collective and denote the specific charges and responsibility of the group to eradicate the pandemic spread (Spencer, 1993). More importantly, task force teams mainly consist of well trained persons with complementary skills organized

to function the TFC cooperatively as a group. A task force composed of experts in the areas of resource development, health promotion, and infection control policies is appointed to explore options for improving the process for developing junior faculty members (O'Leary, 1996). Hospital-acquired infections are also called as healthcare-associated infections which are mostly the nosocomially acquired infections that are typically absent or incubating at the time of admission in the hospital (Maitin, 2015) (Chiumello, no date). They are monitored closely by agencies such as the Center for Disease Control and Prevention (CDC) in efforts to prevent their occurrence and improve patient safety (Bennett *et al.*, 2009). These infections include central line-associated bloodstream infections, catheter-associated urinary tract infections, surgical site infections, hospital-acquired pneumonia, ventilator-associated pneumonia, and Clostridium difficile infections (Grillo, 2004; Priyadharsini *et al.*, 2018a). A pandemic is an outbreak of global proportions. It happens when infection due to a bacterium or virus becomes capable of spreading widely and rapidly (Mangham and Hanson, 2010; Danna, 2018). The disease behind a pandemic can cause severe illness and spread easily from one person to the next (Morens, 2009). If an infection becomes widespread in several countries at the same time, it may turn into a pandemic and emergence of drug resistant bacteria too need to be at a check (Mathews *et al.*, 2009; Paramasivam, Priyadharsini and Raghunandhakumar, 2020). This review thus highlights the guidelines to draft the TFC with their rules and responsibilities to control the hospital acquired infections.

RETRIEVAL OF LITERATURE DATA:

Relevant articles were identified via PUBMED, GOOGLE SCHOLAR MeSH, Cochrane, bioRxiv, Semantic scholar search engines using the keywords pandemic, epidemic, hospital acquired infection, task force committee. Period of duration considered was from 1980 to till date. Out of the totally searched article, 51 articles were selected, out of which 48 are of known concept and 3 articles with recent updates and modifications.

Risk in major pandemic and epidemic:

Risk of pandemic and epidemic conditions have occurred throughout history and appear to be increasing in frequency, particularly because of the increasing emergence of viral disease from animals (Zhao and Lei, no date; Arabi *et al.*, 2017). Pandemic risk is driven by the combined effects of spark risk (where a pandemic is likely to arise) and spread risk (how likely it is to diffuse broadly through human populations). Some geographic regions with high spark risk, including Central and West Africa, lag behind the rest of the globe in pandemic preparedness related to drug resistant strains (Smiline, Vijayashree and Paramasivam, 2018). Probabilistic modeling and analytical tools such as exceedance probability (EP) curves are valuable for assessing pandemic risk and estimating the potential burden of pandemics.Influenza is the most likely pathogen to cause a severe pandemic (Barrett and Brown, 2008; Garland, 2017). EP analysis indicates that in any given year, a 1 percent probability exists of an influenza pandemic that causes nearly 6 million pneumonia and influenza deaths or more globally. When a pandemic disease breaks out in a particular human population, changes in basic behavior in immediate response to the pandemic outbreak can change the progression of the infectious agent. In particular, it is important to check that the human population is aware that a disease in their proximity can be able to take measures to reduce their susceptibility. If the disease is easily recognized and rapid spread of information occurs, then at the same time there is a strong tendency toward the awareness of a disease and the protective behavior of the outbreak can bring the disease infection rate down significantly. Impacts include significant, widespread increases in morbidity and mortality and have disproportionately higher mortality impacts on LMICs (Abbott, 2007; T, Geetha and Thangavelu, 2019).

Knowledge on sudden outbreaks:

The dependency of hospital- acquired infection is based on the patient's immune status, the prevalence of the various pathogens in the local community and mainly on the infection control practices done at the geographic condition and related to various forms of treatment strategies (Hall-Stoodley, Costerton and Stoodley, 2004; Pratha, Ashwatha Pratha and Geetha, 2017). Hospital-acquired infection risk factor are noticed as the older age, longer hospital stays, multiple underlying chronic illnesses, immunosuppression, recent invasive procedures, frequent encounters with healthcare facilities, indwelling devices, mechanical ventilatory support, and stay in a critical care unit with an increased risk of hospital-acquired infection and in dental set-ups (Malani, 2014; Ashwin and Muralidharan, 2015; Girija *et al.*, 2019). All the health care workers need to be trained to be aware of the pandemics and sudden outbreaks (Martin-Loeches, Rodriguez and Torres, 2018). Not surprisingly, it is noticed that about 20% of most of the nosocomial infections occur in the intensive care unit (ICU) (Shahana and Muralidharan, 2016; Selvakumar and Np, 2017). Due to greater awareness and preventative measures, there has been some progress in reduction in the incidence of some types of hospital-acquired infections (Marickar, Geetha and Neelakantan, 2014; Schönfeld *et al.*, 2018). There was a 50% decrease in the central line-associated bloodstream infections from 2004. About 17 % decrease in infection of surgical sites related to specific procedures is present. From 2011 through 2014, about 8% decrease in C. difficile infections was noticed. There was a 13% decrease in methicillin-resistant S. aureus (MRSA) bacteremia between 2011 through 2014 (Stoney *et al.*, 2018; Vaishali and Geetha, 2018). A. baumannii shows within a short period with 2–10% of mortality rate recorded among patients with chronic urinary tract infections, bacteremia, pneumonia and critically ill patients in ICU (Girija, Jayaseelan and Arumugam, 2018; Priyadharsini *et al.*, 2018b; Girija As and Priyadharsini J, 2019). Innate resistance together with the ability to accommodate extrinsic resistance factors has contributed to the resurgence of this pathogen with the utmost potential. Inflammation is the common feature seen in all types of hospital acquired infections(M, Geetha and Thangavelu, 2019; Sohaib Shahzan, Smiline Girija and Vijayashree Priyadharsini, 2019). Vaccination is preferred inorder to obtain protection from these diseases.(Pratha, Ashwatha Pratha and Geetha, 2017)

Protocols for TFC formation:

Task Force studies are national projects, centrally planned and coordinated and usually implemented on a multi-centric basis. These projects are time-bound, with a goal-oriented approach and clearly defined targets, specific time frames and conducted by standardised and uniform methodologies. This formulation of the task force committee is taking into consideration the national priority areas of research. Collaborating scientists with expertise and infrastructure available to undertake such activities are identified by the Council itself through its Task Forces and other Expert Committees. A task force operations protocol is an essential tool to guide a human trafficking collaborative response. The protocol of the task force committee may include guidelines for the exchange of information between task force members, clearly defined responsibilities of individual task force members when responding to incidents, prosecutorial and investigative guidelines, joint training documents, conflict resolution policy, and a resource directory, among other things. The process of discussing and agreeing on the protocols which are prior to a case or at a time other than the situation when a crisis arises will assist in progression of a case while maintaining positive relationships among task force committee members. The following protocol is set by both the private and public sector in order to control pandemic conditions. Development of protocols on the use of Do Not Attempt Resuscitation to guide decisions about CPR in affected patients. Consider emergency legislative intervention to replace the Supreme Court guidelines on withholding and withdrawing life-sustaining treatment with practical, workable guidelines. Alternatively, develop protocols on withholding or withdrawing life-sustaining treatment that lay down criteria for initiating end of life care discussions, rely on shared decision making amongst physicians and/or their near relatives and require clinical ethics committees to participate in such decisions. Make arrangements for the provision of

adequate and quality palliative care for critically ill affected patients at the end of life. Prepare pandemic triage protocols based on consistent ethical principles which are not arbitrary or discriminate solely on the basis of factors such as age, disability etc., in anticipation of a surge in patients. Prepare clear and simple information in multiple languages for patients about the above protocols, including the rationale underlying them.

Drug resistant strains and infection control:

TFC is also responsible to have a glimpse at the hospital antibiotic protocol surveillance. Major hospital infections are due to microorganism species such as Klebsiella pneumoniae (30%), Acinetobacter species (22%) and Staphylococcus aureus (14%). The multidrug resistant bacterial species prevalent was 58%, Escherichia coli was 50% and 33.3% Klebsiella pneumoniae were AmpC beta lactamase producers or extended spectrum beta lactamase. Prevalence of hospital infection which is taken into consideration by task force committee are pneumonia (21.8%) and surgical site infections (21.8%) were the leading causes, followed by 17.1% of gastrointestinal infections , 12.9% of urinary tract infection and 9.9% of primary bloodstream infection. About 9.1% Acinetobacter species were found to be extensive in drug resistance. TFC contribution is more coordinated in global response during the 2009 influenza pandemic (Nieminen *et al.*, 2005). In West Africa Ebola epidemic occurred 2004in which timely detection of disease based on basic care availability contacts tracing the quarantine about isolation procedures and preparedness outside were organized by a task force committee (Vokes, Bearman and Bazzoli, 2018). Even the health sector with global coordination and response mobilization is required, which is provided by a task force committee. Pandemic influenza outbreak was a new influenza virus which emerged and spread worldwide because of which most people lack immunity (Force* and U.S. Preventive Services Task Force*, 2007; Moureau, 2019).

Antibiotics with the highest susceptibility rates among most of the bacterial species were found to be imipenem. Most of the MRSA strains show resistance to most of the other antibiotics. It shows the requirement of the use of glycopeptide antibiotics, for example vancomycin. Recently, treatment failures caused by some strains with decreased susceptibility to vancomycin (vancomycin intermediate S aureus (VISA)) were reported in Japan and the United States (Hiramatsu *et al.*, 1997). According to EP analysis 6 million people are affected from pneumonia in which task force participation created a drastic decrease in morbidity rate. Indian council of medical research is responsible for a national task force that is divided into five groups (Miller, Rosin and Crystal, 2006). Recently ICMR had released guidelines on framing the task force to concentrate on covid 19 in 2020 (Wagh and Sinha, 2018).

Execution of immediate measures by TFC during epidemics and pandemics:

Task force committee mainly concentrates on Individual behavioural changes concentrating on fear induced aversion in public gathering places especially in a hospital setting (DeMellow and Kim, 2018). Task force committee deals with counselling on reduction of primary causes related to negative shocks in health growth caused by hospital acquired infection during pandemics. It is also involved in Managing Risk transfer mechanisms and risk pooling of sovereign level catastrophe insurance which provide viable options in managing pandemic risk(Weinstein, 1990). Mitigation is a tenable strategy of localized outbreaks to increase global surge capacity. Limits reached on full-scale global pandemic with higher capacity states which focus on own populations (Town *et al.*, 2006). Assessing the overall task of the group, the intermediary success factors in reducing the hospital acquired infections are establishing a schedule of meetings and communications. Develop agendas to facilitate meetings for organizing and reducing mitigation is done (Charu *et al.*, 2011; Alberici *et al.*, 2020). It also ensures the outcomes of the meeting are recorded and distributed to all task force participants who work regarding infection control during a pandemic. It is Actively monitoring current information of data possible to possible pandemics which develop guidance for blood centres regarding hospital transfusion and limit related adverse impacts.

Task force committees are meant not only for evaluation of the primary materials before purchasing but also for reviewing current materials at hospital that leads to favorite quantity and quality of the productivity cost at purchase amount of present materials at hospital ('AIDS Task Force Position Paper', 1988).

Challenges faced by TFC:

Existing problems of organization are discussed within the committee forum and introduction of new ideas proposal for solving problems during pandemic. Some committees are formed to assist the development and establishment of organizational policies for resolving the disputes. Committee structure and its costly affair associated in terms of money and time is greatly concerning (Va and BIOMETRICS TASK FORCE ARLINGTON VA, 2009). According to Committee nature, everyone has an equal chance to speak out about reduction in etiology of hospital acquired infection and take part in discussions (Weinstein, 1989; Haas∗ and Saiman, 2004). It provided time consuming results which can be more effective. Difficulty faced by the task force committee dealing with reduction in hospital acquired infection to reach regular public, since awareness level is low (Dawood *et al.,* 2012). Deficiency of man power available during lockdown for appointment timing, administration difficulties are currently faced problems in organizing task force committees (Patton and Hoffmann, 2007).

CONCLUSION:

TFC plays a vital role in the control of hospital infections during major pandemics and epidemics. With an intimate knowledge on the emergence of the multi drug resistant (MDR) and extensive drug resistant bacterial species, TFC also fulfills the basic requirement for strong policy development on antibiotic stewardship, infection control and antimicrobial surveillance in order to help and guide empirical antibiotic therapy. This review had thus highlighted the guidelines and responsibilities of TFC and their role in the prevention of cross-infection and in major outbreaks of bacterial and other microbial disease.

AUTHOR CONTRIBUTIONS

K.Nirubama:

1. Execution of work
2. Data collection
3. Drafting of manuscript

Smiline Girija AS:

1. Concept and design of the study
2. Validation of the data collection
3. Revision and proof-reading of the review

Ezhilarasan:

1. Validation of the data collection
2. Revision and proof-reading of the review

CONFLICT OF INTEREST

None to declare

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