Syndemics of chronic and acute diseases in vulnerable populations

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Abstract
This study portends to develop and improve the welfare and well-being of vulnerable populations in the interactions or co-morbidities or co-occurrence of re-emerging infectious diseases, obesity, diabetes or metabolic syndrome in contextually, socioeconomic milieu; provide newfangled healthcare research modalities and techniques to vulnerable populations globally; develop and promote evidence-based strategies to mitigate or eradicate health development challenges via inter alia providing innovative research funding to curb inequitable gender norms, perceived internalized stigma, validate a measure of rights-based access to healthcare in co-occurrence of acute and chronic diseases with minimal costs or prices within the spectrum of vulnerable populations. Regarding socioeconomic status and income as facilitator, it is pertinent that public health and national economy modify the allocation of healthcare expenditures to presenting social programmes. One major constraint is that a vast majority of the data on the epidemiology of the interface between chronic and acute disorders with undergirding socioeconomic factors emerge from developed countries, whereas the populations at risk are in LMICs.

1. Introduction
Globally, obesity and diabetes or metabolic syndrome with concomitant re-emerging infectious diseases may be reaching epidemic proportions which are yet undetermined. Co-morbidities or multiple, complex, intricately-linked syndemic expansive phenomenon characterize these untoward events. These may be associated with genetic, environmental, physiologic, psychologic, familial, social, economic and political attributes which merge to confound these aberrations. Expansive interactions influence these conditions, such as inter alia health impact in conurbations, foetal life and maternal physiology, thrifty genotype [1] and perception of increased weight [2].

The simultaneous interactive occurrence of health burdens and perturbations in transition economies or populations regarding socio-cultural-economic contexts provides for conceptual frameworks for sustainable development and improvement to comprehend risk factors in order to better design, formulate and implement optimum prevention and intervention strategies to harness co-morbidities in disease presentation. The syndemic concept propounded by medical anthropologists makes provision to prevent, treat and control co-morbidities as synergistic health perturbations which contextually impact on the health of a population in the face of persistent social, economic and political inequities or inequalities [3]. It is pertinent to provide research and systems of medical care to the potential beneficial application of syndemic care to patients with interactions in re-emerging infectious diseases, obesity, diabetes or metabolic syndrome.

2. Re-emerging infectious diseases
Africa presents unenviable and untoward challenges regarding the double burden of infectious diseases and non-communicable diseases with accelerated progression in the continent [4]. Just like Ebola and meningitis, the sad story bedevils Africa’s vulnerability to deadly infectious diseases [5] which are re-emerging [6]. The first index case of the deadly Ebola virus disease was reported on July 30, 2014 in Nigeria having been imported from Liberia by a male infected person, one Patrick Sawyer. The disease was first detected in Sudan and Zaire as well as other East African countries in 1976, where an excess of 284 persons were infected, and a mortality rate exceeding 53 percent in Sudan and Zaire. Following these events, the next discovery was in 1994 in Cote d’Ivoire accidentally self-infecting a female etiologist conducting necropy on a chimpanzee from the Tai Forest. The 2014 outbreak in West Africa has become the most expansive and devastating intricately complex Ebola outbreak since the annals of the history of the initial incident of 1976. The 2014 outbreak overwhelmed Guinea, Liberia, Mali, Nigeria, Senegal, and Sierra Leone with debilitating morbidity and mortality [5].

In 2015 and 2016, Lassa Fever struck several States in Nigeria, with the Nigerian government exerting strong political will to stem and combat all these re-emerging infectious diseases. These diseases are seasonal and the government tends to present safer modalities for the provision of an improved and safer ambient for the populace. Recently, cerebrospinal meningitis that is a disorder producing inflammatory response to the brain and spinal cord linings re-emerged in Sokoto and Zamfara States of Nigeria, and invaded more than fourteen other States with consequent elevated morbidity and mortality. Reports are available that the Federal Government of Nigeria embarks to spend circa $1.1 billion in the vaccination of 22 million persons in merely five Northern States against meningitis, and for all the 16 States involved to obtain an expenditure of $3.3 billion dollars for vaccination services [5].

Africa predicts a multifarious climate ranging from expansive desert region to tropical rain forest which promote fertile and suitable ambient for a vast majority of disease vectors. Other portending factors include lack of research funding, vector ignorance of disease life history, intermecine conflict, and overpopulation in endemic and erstwhile spare areas, inadequate nutrition, short food and agricultural supply and produce resulting in reduction of the viability of the immune system to combat re-emerging infectious diseases. High-income countries have been able to circumvent the SARS epidemic [7] due to enhanced immune system and other attributes.

3. Obesity and cigarette smoking
Even at its debilitative state, obesity compounded with cigarette smoking has been established to be detrimental to health and healthcare in high-income or developed countries [8]; while obesity...
levels increased globally in most populations [9]. In 2013, 20% of global adult population in high-income countries were estimated to present with obesity as a body mass index, BMI of circa 30kg/m^2 [10]. It is explicit that both smoking and obesity severally or jointly contribute to low life expectancy differentials of the USA relative to European countries [8], and to within country death rate disparities employing variables, such as socioeconomic status [11,12].

Irrespective of the expansive concern in health-related risks and behavioural attributes, there is anecdotal with paucity of information associated with persons or populations of diverse countries exposed to disparate categories of risks. It is axiomatically expressed that to compare and contrast mortality and morbidity risks across countries from expressed behaviours are amenable to decipher how characteristics of health systems and epidemiological presentations modulate or exacerbate health impacts of risk-associated behaviours. An evaluation of both presenting and erstwhile cigarette smokers in association with presenting and previous obesity from 1971-2014 in the USA and Finland employing representative samples to elucidate the cross-sectional disparities in mortality risks resulting from a combination of cigarette consumption and presenting obesity. In 1990, the approximate midpoint of the investigation, the mortality risks from ongoing smoking were circa 55% greater in USA women in comparison to Finnish women, but exhibit identical results for male persons in both countries. Mortality risks due to smoking were markedly elevated within the investigation period for female persons in the two countries with no simultaneous increase in risks among male individuals. There was no significant disparity regarding mortality risks from obesity in both countries, with no marked trend was detected in both countries [13].

Inasmuch as international comparative analyses may elucidate whether health system characteristics and cohort behavioural attributes in the modulation and exacerbation of risks in smoking combined with obesity, it is perspicuous that the USA and Finland study did not take into full and proper cognizance of the expansive pluralistic USA society in contradistinction to the almost homogenous Finnish clime with the former’s clear-cit ethnic and racial disparities which are not clearly depicted in the latter which ought to be extrapolated to other contexts, such as elevated level of poverty, diet and nutrition in the USA amongst indigenous Americans, African Americans, Hispanics or Latinos and other immigrants from low socioeconomic background not undergirded by preponderant social security system as in Finland.

3. Diabetes

Numerous genuine risk models have been established which validly predict incident diabetes in specific adult populations [14,15]. Full and proper application of these risk models in the valid clinical settings adequately identify adults at increased risk of diabetes development, and are liable to beneficial preventive modalities. Furthermore, evaluation of numerous adult diabetes risk calculation techniques to predict the development of incident diabetes and pre-diabetes among a bi-racial, young adult population showed that diabetes risk scores present in middle-aged, racially homogenous adult community are invariably amenable to younger adult populations with good specificity and consequential poor sensitivity. The results depicted greater diabetes risk for blacks for incident diabetes and pre-diabetes in contradistinction to whites presenting equivalent risk scores. The inclusion of race to this approach did not relate in higher predictive potentials; thereby, necessitating future research for a more sensitive risk score in predicting diabetes in the younger adult populations [16].

4. Interactions of obesity, diabetes, infectious diseases and other disorders

Obesity exacerbates morbidity and mortality via its multifarious impacts on almost every human organ or system. Obesity presents certain impacts on the immune system via diverse immune mediators resulting to infection susceptibility. Evidence suggests that obese people are more vulnerable than non-obese persons or normal persons to acquire and develop a variety of infections as such nosocomial infections as postoperative infections and other complex sequelae [17]. Moreover, obesity and diabetes have been determined to be associated with elevated odds of mortality due to invasive group A Streptococcus, IGAS infections as determined after adjusting for age group, gender, race and other underlying variables in comparison, respectively to normal weight and nondiabetic patients [18]. This needs to be extrapolated in studies involving reemerging infectious diseases.

Obesity is strongly associated with increased risks of type 2 diabetes (T2D), cardiovascular disease and other presenting chronic disorders. Estimates of prevalence are well-established for metabolic disorders in numerous populations, but these are far-fetched in the Alaska population. An investigation combined data from three Alaska Native study cohorts to assess disparities in obesity prevalence and relationships with cardiometabolic risk factors by sex [19]. It was found that cardiometabolic risk factors in female persons were minimally associated with obesity, with higher obesity and central adiposity than male persons; as well as women presenting elevated HDL-C and triglycerides than the men. Relative disposition of increased blood pressure, LDL-C and glucose were observed in men more than in women. Thus, obesity prevalence among indigenous peoples residing in the circumpolar regions of Alaska, Canada and Greenland constitutes an exacerbating influence and of major health concern and predicament [20,21] for sustainable living and lifestyle.

It has been determined that Latinos are susceptible to increased risk for obesity and type 2 diabetes, T2D, as properly designed information technology, IT interventions have exhibited efficacious improved diabetes self-management, with a paucity of published IT intervention studies concerning Latinos, though. There are few studies on the most feasible approach to strategize on the discrete and unique sociocultural linguistic features which are liable to optimize adoption, utilization and benefit between Latinos. Sustainable e-health programmes associated with frequency in communication, bidirectionality or feedback and multimodal delivery of the intervention provide successful approach to the strategy. The utilization of community health workers, CHWs has consistently improved T2D outcomes in Latinos. The inclusion of CHWs in e-health interventions facilitates to mitigate the barriers associated with the difficulty in technology awareness and literacy with concomitant improvement in patient activation, satisfaction, adherence and compliance. Also, purposeful directed approach or tailoring to suit their needs in these interventions tend to be highly successful for improving patient activation. It is crucial to realize that tailoring is not merely linguistic translation, but involves intervention to the Latinos populace with optimum need to focus on educational language, literacy and acculturization contents simultaneously with discrete and unique illness beliefs, customs and attitudinal disposition concerning T2D in the Latino sociomedical concept in the community. Interventions ought to be expansive as to reach beyond solitary participants by inculcating shared decision-making models of friends, family and others in the community [22].

5. Discussion and Conclusion

The inextricably-linked complex epidemiological, clinical and biological interfaces undergirding chronic diseases, such as obesity and diabetes with re-emerging infections have limited published and researched history. However, the resultant impact of obesity and diabetes on the immune system, whether jointly or severally, is expansive and complex effecting incidence and severity of infections. Obesity and diabetes predominate in the pandemic of non-communicable diseases, NCDs presently expanding globally with debilitating impact in low- and middle-income countries, LMICs with special effect in certain
conurbation [23]. It is perspicuous that there is greater frequency and difficulty to manage persons with diabetes and/or obesity particularly in the presence of opportunistic organisms.

One major constraint is that a vast majority of the data on the epidemiology of the interface between chronic and acute disorders with undergirding socioeconomic factors emerge from developed countries, whereas the populations at risk are in LMICs. Adequate prevention of infections in obesity and diabetes constitute a vital objective. Inasmuch as it is well-nigh impossible to determine the encompassing morbidity and mortality, the extent evidence and data are ominous of a combined chronic and acute disease as an exacerbating public health concern. The resultant premise is that the chronic inflammatory posture of diabetes and obesity results in debilitating immune responses with extant infections. Research, preventive, newfangled therapeutic strategies are required in a global scale, particularly in LMICs where there is vast emergence of the greatest risk coupled with least availability of detection, treatment and control; and especially in extant co-morbidity that also involves cardiovascular diseases and hypertension [24,25]. The adverse sequelae of diabetes and obesity may present deranging impacts on the global burden of reemerging infectious diseases.

This study portends to develop and improve the welfare and well-being of vulnerable populations in the interactions or co-morbidities or co-occurrence of re-emerging infectious diseases, obesity, diabetes or metabolic syndrome in contextually, socioeconomic milieu; provide newfangled healthcare research modalities and techniques to vulnerable populations globally; develop and promote evidence-based strategies to mitigate or eradicate health development challenges via inter alia providing innovative research funding to curb inequitable gender norms, perceived internalized stigma, validate a measure of rights perceived internalized stigma, validate a measure of rights

References


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