Psychosomatics: Past, Present and Future

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Psychosomatics, a term attributed to Heinroth in 1818, has been an enduring theme in explaining the genesis and maintenance of disease states since antiquity [1, 2]. As the Enlightenment fostered a more scientific attitude towards medicine, physicians continued to report the role of emotions in disease states. Thus, in the 17th century, Sir Thomas Willis observed that sorrow brings on the sweet urine (diabetes). This underscores the problem that has plagued psychosomatics, *observation*, such as Willis's aphorism in the absence of *experimentation* that is required to confidently link such emotions to disease genesis or comorbidity [3]. The sorrow that he observed may well have been a confounding factor of fatigue inherent in the diabetic state. As modern medicine emerged with advances in physiology and molecular biology, physicians began to ignore psychiatric issues [4]. Nevertheless, the psychosomatic paradigm endured. This editorial will focus primarily upon the psychosomatic development of psychosomatics in North America during the last 100 years. The excellent work from Europe has been reviewed recently by Schuffel [5].

Modern psychosomatics arose with the psychoanalytic revolution to explain the genesis of many diseases while stress research incorporated the basic physiology of fear and flight to explain how emotional factors are interrelated in disease states. The psychoanalysts postulated that

unconscious factors were important in the genesis of disease states [6]. The limitation of early psychoanalytic reports was that the observations were deductive, that is top-down reasoning with psychoanalytic theory considered as general truth. This led to conclusions that were biased by such all-encompassing beliefs [7]. Yet some psychoanalysts attempted to utilize more rigorous qualitative and quantitative strategies. Michael Balint [8] qualitatively studied primary care physicians' interactions to explain how they understood their psychological problems. Peptic ulcer disease demonstrates the interplay between psychological, biological, and social issues. Franz Alexander [9] popularized mind-body themes in peptic ulcers by conceptualizing specific unconscious conflicts over dependency that combined with constitutional factors to produce such disorders. Arthur Mirsky [10], an internist, physiologist and psychoanalyst, developed seminal research on the biopsychosocial aspects of peptic ulcer disease, utilizing urinary pepsinogen as a biologic marker and projective tests to ascertain psychological issues in candidates undergoing the stressful Army indu-

A modified version of this paper was read as the Presidential Address at the 22nd World Congress on Psychosomatic Medicine, Lisbon, Portugal, 2013.

Fig. 1. Z.J. Lipowski, MD.

Fig. 2. George L. Engel, MD.

cion process. He found that psychological vulnerabilities interacted with biologic elements (elevated pepsinogen) to produce the duodenal ulcers in the study cohort [11]. *Helicobacter pylori* is currently considered to be a pathogenic factor in about 70% of patients with this disorder [12]. Subjects with peptic ulcer disease also have elevated levels of neuroticism, report more stress in their lives and have a lower socioeconomic status than comparative populations [13–15]. Thus, modern molecular biology expands our knowledge of disease and health but also reaffirms psychosomatic concepts [16, 17].

As medicine evolved to a true science utilizing scientific methods to understand the pathology, diagnosis and treatment, many physicians abandoned psychosocial factors and focused primarily on the objective and quantitative elements of a disease process. This did not suggest that they were ignoring patient suffering but tended to minimize the scientific importance. Grinker [18] coined the term *biopsychosocial* to urge psychiatrists to incorporate such advances, rather than rely purely on psychoanalytic dogma. Fifty years before this call for attention to biological issues, psychiatrists began to recognize external organic elements (toxic states) that foster delirium. Delirious states were often discussed by 19th century physicians [19] as specific case histories and eventually led Karl Bonhoffer [20] to categorize them as ‘exogenous psychoses’, but this was primarily found in the European and British literature. In North America, delirium studies focused upon alcohol withdrawal phenomena [21]. Lipowski [22] combined such literature with his remarkable scholarship (fig. 1). His influence in DSM-III and DSM-IV led to the broad category of organic mental disorders [23]. He then regularly updated research on delirium in classic review articles [24].

In contradistinction to Grinker who urged more attention to biology, George Engel [25, 26], an internist and psychoanalyst, began to advocate a more comprehensive approach to the patient rather than a total focus upon the molecular biologic systems (fig. 2). The biopsychosocial approach was widely disseminated in his classic article, ‘The need for a new medical model’ [27]. His work reaffirmed Osler’s aphorism that it is essential to know *who* is the patient as well as *what* disease they have. Engel began his career with biologically focused research on delirium. Engel’s concept of delirium ‘as a syndrome of cerebral insufficiency’ taught the general medical audience, not just psychiatrists, a clinically useful approach to identify and manage the acute organic brain syndromes [28]. He then shifted from delirium to the role of affective states in an infant with a gastric fistula [29, 30]. His most enduring contribution, however, was medical education where he taught students to appreciate psychosocial issues in medical patients. He emphasized the importance of looking at each person as his/her own unique control to better understand the life setting in which the patient became ill [31, 32]. Often individuals were found to have problems with separation from important people termed ‘vicarious objects’ or to be experiencing feelings of helplessness and hopelessness that led Engel and Schmale to develop the concept of the conservation-withdrawal syndrome [33–37]. Although much of the work was obser-

vational, they developed interview techniques utilizing open-ended questions that became important vehicles for understanding patients. It is not by accident that the father of modern psychoimmunology, Robert Ader [38, 39], worked at Rochester and was a regular participant in Engel's seminars. Engel's work, however, is not without its critics. Ghaemi [40], in a provocative book entitled *The Rise and Fall of the Biopsychosocial Model*, challenges Engel's biopsychosocial construct. His critique asserts that Engel did not outline a method to study the tripartite biopsychosocial elements of each individual. Such critiques have also been voiced by others who also emphasize the methodological differences between *Erklären* methods (methods of explanation), which denote a more empirically based approach, versus those of *Verstehen*, which requires empathy and understanding [41, 42]. Schwartz and Wiggins [43] had earlier voiced similar critiques. A published symposium entitled *Biopsychosocial Medicine* also discusses the benefits and challenges of the biopsychosocial model in a less polemical manner [44]. Despite such criticism, Engel's legacy endures as a clinical compass to the patient encounter [45].

Social factors have long been considered as important elements in understanding health and disease [46]. Low socioeconomic status can be a major variable in elevating the risk of infectious disease as well as other disease states, such as coronary vascular disease. In contrast to what animal and human studies demonstrate, social support provides a buffer against disease states. Some investigators estimate that the lack of social support is equivalent to hypertension, smoking or obesity as a health risk factor [47]. Hinkle [48] found a clustering effect indicating that a subset of individuals within a larger population utilize more health care services irrespective of their actual physical health status. He hypothesized that for such individuals the social environment was threatening or that they lacked support. Hinkle urged more attention to the individual-social system nexus in disease and health. He termed this focus upon the social environment *human ecology*. His prescient ideas on social support and cohesion were reaffirmed in a longitudinal study by his colleague at Cornell, Stewart Wolf. Wolf, an internist, explored the anomalous finding of very low rates of cardiovascular disease in a small Pennsylvania town, Roseto, in comparison with neighboring towns composed of similar Italian immigrants. He found that as individuals in this town moved to suburbs, the rates of cardiovascular disease rose to equivalent levels of their neighbors. The investigators concluded that social support and cohesion was the preeminent factor in such risk disparity [49–51].

Psychosomatics currently is an exciting area due to the growth of experimental approaches rather than pure observation. Stress physiologists such as Pavlov, Selye, and Walter Cannon utilized their laboratories to demonstrate the role of the autonomic nervous system as a reaction to stress. Current animal models have demonstrated the neuroplastic effects of chronic stress, which can change the actual brain morphology. Thus neuroscience elucidates mechanisms of psychosomatic phenomena [52]. This has led stress research to conceptualize the phenomenon of 'allostatic' load which denotes the physiologic processes that allow an organism to maintain internal stability despite external changes [53]. Allostasis is a sophisticated iteration of Bernard's homeostasis of the necessity of stable physiologic stability. McEwen has evolved this concept to study stress that cascades from cognitive elements such as symbolic meanings of external events to physiological dysregulation [54–57]. From a clinical perspective, consultation liaison psychiatry has been the clinical derivative of psychosomatic medicine. This subspecialty of psychiatry is currently moving from hospital-based settings to the ambulatory sector [58, 59]. Although such outpatient endeavors have been termed 'integration', it is more accurately labeled collaboration. Collaborative care models have been more successful in a closed panel health care system rather than open fee for service [60, 61]. How to utilize psychosocial principles in both resource-rich developed countries and those with less robust health systems in a cost-effective and clinically meaningful manner remains to be answered.

A significant challenge in psychosomatic medicine currently has been whether any psychosocial interventions can really modify the course of disease once it has presented. In the case of cardiovascular disease, the impetus for this was the observations by both Osler [62] in 1912 and later Meyer Friedman [63] that a type A personality, characterized by worry over time, hostile cynicism, and work pressures, is a risk factor for cardiovascular disease. Sirri et al. [64] have carefully reviewed the current conceptualization of this construct [65]. There is clear data that behavioral therapy as well as medication such as buspirone can change elements of type A personality but the long-term outcomes from such interventions are not known [66–68]. The ENRICH D study that attempted to use cognitive behavioral therapy for cardiac patients who were depressed or socially isolated found improvement in quality of life but not mortality rates. Rafanelli et al. [69] discussed data from a variety of similar studies and suggests that investigators are perhaps looking at the wrong variables for such outcomes but may wish to consider

personality factors such as type A characteristics. In another disease state, i.e. breast cancer, group therapy may improve survival for at least 12 months [70]. Thus, questions regarding psychosocial treatments modifying disease outcomes remain to be answered.

The future of psychosomatics is exciting. The 'black box' that connects psychosocial factors to biology is becoming less opaque. Epigenetics may explain how environmental elements (both psychological and social) relate to disease vulnerability [71]. Molecular biological data indicate that fear and anxiety may directly promote gene activation via histone acetylation or that demethylation can modify chromatin remodeling [72, 73]. This can result in a variety of health outcomes that include neoplastic, autoimmune and psychiatric disorders.

Neuroscience is beginning to study the role of telomeres, which are protective caps that reflect the function-

al age of a chromosome. Investigators find that chronic stress reduces telomerase length and thus in essence promote functional aging and potentially disease onset in those stressed [74, 75]. Such data may explicate allostasis, the relationships between stress and disease genesis.

In conclusion, psychosomatic medicine has a proud past but an exciting future that will begin to 'document' the importance of psychosocial factors in clinical assessments in future research. The historic role of clinical observation has generated hypotheses that can guide experimental approaches to integrate biopsychosocial constructs. No rigorous 'evidence-based study' can now ignore psychosocial variables [76, 77]. A truly psychosomatic approach will illuminate the questions raised in our current unitary approaches that ignore the biopsychosocial approach to disease genesis and treatment [78].

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