

173:257

Infectious Causes of Chronic Disease

Spring 2007

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Department: Epidemiology

Credit Hours: 3

Prerequisites: Pre- or co-requisite: 173:140 Principles of Epidemiology

Course Description:

Many typical chronic diseases have increasingly been found to have an infectious etiological component. This course will examine the evidence linking various infectious agents with the development of different types of chronic disease.

Purpose of the Course:

As early as the mid 19th century researchers were exploring the idea that chronic conditions, such as cancer, were caused by infectious organisms. During the epidemiological transition when the book on infectious diseases was thought to be closed and the concomitant increase in research on "life-style" factors began to flourish, a line was formed distinguishing chronic and infectious disease research agendas. This distinction has been dissolving as an increasing number of infections are being implicated in the multifactorial risk profiles of chronic health outcomes. It is evident that there are numerous methodological, sociological, and biological factors that must be considered when evaluating the epidemiological literature supporting a link between infection and chronic disease. Some examples of these issues include the need to explore the role of co-factors and the influence of socioeconomic and other demographic determinants on the pathways between infection and chronic disease outcomes; assess the type of damage that may be caused by a particular organism ("hit and run" versus chronic infection); measure and characterize latent and recurrent infections as well as immune response; gather data on the interaction between co-infections or overall burden of infection with multiple pathogens; detect new infectious organisms and devise methods for isolating organisms from tissue or serum. These and more will be discussed in this course, using examples from the primary literature.

Teaching methods:

The course is comprised of didactic lectures and discussions, focusing on analysis of primary literature. Readings and assignments will be communicated through the course web site.

Course Objectives:

The gulf between the study of “infectious” and “chronic” disease epidemiology has significantly narrowed in the past few decades. It is recognized that many diseases that have long been considered to be diseases of aging or lifestyle have additional infectious etiological components.

After completing this course, the student should be able to:

1. provide evidence for and against many of these hypothesized cause-effect relationships,
2. critically analyze primary biomedical literature on this topic;
3. design an appropriate experiment and/or study to answer a research question.

Grading:

Students will be graded based on their performance on 2 written examinations (45% each) and participation in class/homework assignments (10%).

Required materials:

None. Optional book: Paul Ewald, “Plague Time.”

Office hours:

By appointment.

Topical Outline:

Class	Date	Instructor	Topic
1	1/17	Smith	Introduction to course, requirements, expectations
2	1/22	Smith	Introduction, history, and background—infectious causes of chronic disease
3	1/24	Smith	Introduction continued—examples of rubella, polio, syphilis.
4	1/31	Smith	Evolution, human biology, and disease
5	2/5	Smith	How do we determine causation? Problems, difficulties, and methods in determining infectious components of chronic disease.
6	2/7	Smith	Our “normal” flora—what role do they play in disease development and/or prevention?
7	2/12	Smith	<i>Helicobacter pylori</i> and ulcers, esophageal, and gastric cancer
8	2/14	Smith	Hepatitis viruses and liver cancer
9	2/19	E Smith	HPV and cervical cancer
10	2/21	Smith	Oral microbes, alcohol, and cancer
11	2/26	Smith	EBV and Burkitt’s lymphoma, nasopharyngeal carcinoma, B-cell lymphoma, posttransplant lymphoproliferative disease
12	2/28	Smith	HHV-8 and Kaposi’s sarcoma, other tumors
13	3/5	Smith	HTLV and adult T-cell leukemia/lymphoma
14	3/7	Smith	Exam 1
	3/12		SPRING BREAK
	3/14		SPRING BREAK
15	3/19	Smith	<i>Salmonella typhi/paratyphi</i> , gallbladder cancer
16	3/21	Smith	Evidence for and against a “breast cancer virus”
17	3/26	Smith	<i>Schistosoma haematobium</i> , bladder cancer
18	3/28	Smith	<i>Chlamydia pneumoniae</i> and heart disease
19	4/2	Smith	Bowel diseases: MAP and Crohn’s disease, colorectal cancer and commensal microbes.
20	4/4	Smith	<i>Streptococcus pyogenes</i> and OCD, tics, Sydenham’s chorea
21	4/9	Smith	Prions and other infectious agents in neurodegenerative disease
22	4/11	Smith	Chronic kidney complications following <i>E. coli</i> infections
23	4/16	Smith	<i>Borrelia burgdorferi</i> and arthritis
24	4/18	Smith	Chronic outcomes of meningitis
25	4/23	Smith	The many causes of multiple sclerosis
26	4/25	Smith	Infections during pregnancy and chronic complications in the offspring—examples of <i>Ureaplasma urealyticum</i> and RSV
27	4/30	Smith	What role do infectious agents play in the development of asthma?
28	5/2	Smith	Type I diabetes—triggered by an infectious agent?
	5/9		Exam 2