

Pharmacoepidemiology versus Clinical Pharmacology and Epidemiology

Vijaya Krishna Varanasi*

Post doctoral research, Washington State University, USA

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The aim of the Journal “Pharmacoepidemiology and Drug Safety” is to provide an international forum for communication and evaluation of data methods and opinion in the emerging discipline of pharmacoepidemiology. The Journal publishes peer-reviewed reports of original research, invited reviews and a variety of guest editorials and commentaries embracing scientific, medical, statistical, and legal aspects of pharmacoepidemiology and post-marketing surveillance of drug safety. Appropriate material in these categories may also be considered for publication as a Brief Communication. Particular areas of interest include: design, analysis and interpretation of post-marketing surveillance and other studies looking at specific drugs in populations and methods for detection and evaluation of drug-associated adverse events, assessments of risk versus benefit ratios in drug therapy, patterns of drug utilization, and the formulation and interpretation of regulatory guidelines.

Pharmacoepidemiology is a branch of science that investigates the use and effects (beneficial and deleterious) of medications (“pharmaco”) in large populations (“epidemiology”). Pharmacoepidemiology is called a bridge science bringing together pharmacology and pharmacy, clinical specialties, epidemiology, biostatistics, demography and social sciences. Epidemiology and clinical pharmacology are the two main bridgeheads. Pharmacoepidemiological studies identify the associations between a drug and one or more clinical events that had been missed in therapeutic trials. About 100,000 Americans die each year from Adverse Drug Reactions, and 1.5 million US hospitalizations each year result from Adverse Drug Reactions (ADRs). Unfortunately, about 20-70% of ADRs may be preventable. The harmful and the negative side effects of drugs has led to the recent emergence of the field of pharmacoepidemiology [4].

Pharmacoepidemiology versus Clinical Pharmacology

Pharmacology is the branch of medicine and biology concerned with the study of drug action [5]. Clinical Pharmacology is the study of the effects of drugs in humans. Pharmacoepidemiology is a part of Clinical Pharmacology and can provide vital information about the positive and negative effects of any drug, resulting in a better evaluation of the risk/ benefit ratio for the use of a drug in a patient.

Clinical pharmacology is categorized into two main areas: Pharmacokinetics and Pharmacodynamics. Pharmacokinetics (PK) (pharmakon: “drug” and kinetikos: “to do with motion”) is dedicated to the determination of the fate of substances administered externally to a living organism. It deals with drug absorption, distribution, metabolism and excretion. Pharmacokinetics is often studied in relation to pharmacodynamics. Pharmacodynamics is the study of the relationship between drug level and drug effect. Pharmacokinetics may be simply defined as what the body does to the drug, as opposed to pharmacodynamics which may be defined as what the drug does to the body.

Pharmacodynamics and pharmacokinetics make it possible to know the effect of certain drug inside the body of a patient. Pharmacoepidemiology includes contributions from both these fields, exploring the effects achieved by administering a drug regimen.

Pharmacology versus Epidemiology

Epidemiology is the study of the distribution and patterns of health events, health characteristics and their causes or influences in well-defined populations. It is the cornerstone method of public health research, and helps inform policy decisions and evidence-based medicine by identifying risk factors for disease and targets for preventive medicine. Pharmacoepidemiology is a part of epidemiology since it deals with the effects of drugs in large numbers of people or in a population. Despite the fact that pharmacoepidemiological approaches can be useful in performing the clinical trials of drugs that are performed before marketing, the major application of these principles is after drug marketing. Pharmacoepidemiology acquires its focus of inquiry from clinical pharmacology and its methods of inquiry from epidemiology [6]. During this process, various logistical approaches have been developed and methodologic issues have arisen [7].

Normally, clinicians are more interested in knowing the effects of a new drug and its costs. However, little attention is paid to any negative side effects of the newly synthesized drug. The existence of any adverse effects of a drug and its safety is one of the most important contributions that can be made by pharmacoepidemiology studies. All drugs have one or more side effect which cannot be avoided. But if we can detect those side effects a little early through various pharmacoepidemiological approaches and educate health care providers as well as public, it could result in better medication use. Increased research efforts in pharmacoepidemiology will be better for pharmaceutical industry and academia but most importantly, for

*Corresponding author: Vijaya Krishna Varanasi, Post doctoral research, Washington State University, USA, E-mail: vijaya.varanasi@gmail.com

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public's health. I am confident the open access OMICS Group Journal "Advances in Pharmacoepidemiology and Drug Safety" will make a positive impact in this direction.

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