CPCSSN's role in improving pharmacovigilance

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Before a new therapeutic drug can be sold in Canada, it must be tested in randomized controlled trials for safety and efficacy. However, when it reaches the market, it might be used by populations different from those in the trials; consequently, the range of potential adverse reactions (ARs) cannot be fully known before routine use in clinical practice. To avoid or minimize harm from ARs, most countries use post-market surveillance to identify new drugs' risks as quickly as possible.

Pharmacovigilance systems depend on the reporting of suspected ARs. In Canada, post-market surveillance relies primarily on voluntary or passive reporting by health professionals and consumers. Passive surveillance is an efficient and cost-effective approach to early signal detection because of its ease of implementation, low cost, ability to detect rare events, and well-developed data mining methods, and it is well established as a crucial component of drug safety and effectiveness monitoring. However, passive surveillance also has recognized limitations: problems with data quality, underreporting, missing or inadequate denominators, and the lack of appropriate comparator groups for signal confirmation. Adverse reaction reports, particularly those from consumers, often lack the detail needed to determine the nature of the relationship between the drug and the adverse event. A 2006 systematic review of studies on underreporting found that the median underreporting rate was 94% (interquartile range 82% to 98%).[1] The low reporting rates were often related to the severity of the reaction, how long the drug had been on the market, the attribution of symptoms to a drug (ie, recognition of a potential association), and knowing when and how to report ARs. As well, because ARs are reported on a voluntary basis from a population of unknown size (ie, missing denominators), regulators cannot determine reactions' frequency or incidence.

Improved access to more and higher-quality patient data could overcome many of these limitations. Some have called for mandatory AR reporting, which could place an undue burden on affected individuals and institutions. However, using large electronic medical record (EMR) databases, such as that of the Canadian Primary Care Sentinel Surveillance Network (CPCSSN), could address several of the passive surveillance systems' limitations. For example, using CPCSSN's database for pharmacovigilance would overcome the considerable problem of underreporting, and also provide a reliable denominator, permitting calculation of AR event rates or incidence. Accordingly, CPCSSN has been working with the Marketed Health Products Directorate of Health Canada to determine the feasibility of using EMRs to facilitate AR reporting to Health Canada. If successful, this approach could not only enhance current efforts aimed at signal detection and mitigate the need for mandatory reporting, but also enable signal refinement and confirmation.

As of September 2013, the CPCSSN database housed 250 000 AR records for 600 000 patients. How complete are the adverse event data? To find out, we selected 5 demonstration health products, including bisphosphonates and rosiglitazone. In total, 462 patients with documented predating prescriptions had a recorded AR to a bisphosphonate or rosiglitazone. Age and sex were recorded for 461 (99.8%) of these patients, and height and weight were recorded for 302 (65.4%) and 342 (74.0%) patients, respectively. Ethnicity was poorly recorded, with data in the proper field for only 28 patients (6.1%).

Of premier importance to pharmacovigilance is information about the suspected product. For bisphosphonates and rosiglitazone, strength was recorded in the strength field for 239 patients (51.7%); dose, in the dose field, for 337 patients (72.9%); and route, in the route field, for 138 patients (29.9%). Often the missing strength, dose, or route information could be found elsewhere in the record, but to extract it in a usable format would have required more work.

Further work is needed before CPCSSN's potential can be maximized in pharmacovigilance. Pharmaceutical and AR data would need cleaning and coding. As well, primary care physicians would need to enter ARs in appropriate and consistent places in their patients' EMRs. Nonetheless, the wealth of data routinely collected in clinical care and residing in CPCSSN's database clearly offers a unique opportunity in the area of pharmacovigilance.

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None declared

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Reference

1. Hazell L, Shakir SA. Under-reporting of adverse drug reactions: a systematic review. *Drug Saf* 2006;29(5):385-96.

Cet article se trouve aussi en français à la **page 679**.

Sentinel Eye is coordinated by CPCSSN, in partnership with the CFPC, to highlight surveillance and research initiatives related to chronic illness prevalence and management in Canada. Please send questions or comments to Anita Lambert Lanning, CPCSSN Project Manager, at all@cfpc.ca.