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Medication-Related Visits to the ER

A patient's misuse of their medication lands them in the emergency room. How often does it happen? How often is the patient admitted to the hospital and what's the overall impact on the healthcare system?

Welcome to Focus on Pharmacy. I am your Dr. Charles Turck, PharmD. Our guest is Dr. Peter Zed, PharmD, a pharmacy specialist in emergency medicine and an associate professor in the Department of Emergency Medicine in the College of Pharmacy at Dalhousie University in Halifax, Nova Scotia. Dr. Zed is the lead author of research published in the Canadian Medical Association Journal on medical related visits to the emergency room.

DR. CHARLES TURCK:

Welcome Dr. Zed.

DR. PETER ZED:

Thank you for having me.

DR. CHARLES TURCK:

We are discussing medication related visits to the emergency department, could you give us an idea of the scope of the issue of drug-related adverse events and the relationship with ED visits.

DR. PETER ZED:

Adverse drug events have been area of study within the patient safety realm for a number of years now. One of the kind of glowing deficiencies that we have in the literature to date is really the impact of medication related visits that we have to our emergency departments. A number of studies in the past have attempted to look at this from a retrospective approach, and as a result have probably underestimated significantly the impact just simply due to data loss and poor ability to capture things in a retrospective manner. So essentially what attempted to do with our latest research project was to actually look at this from a prospective design and attempted to capture all visits of patients that present to the emergency department and what we ended up finding was that about 12% of the visits within our study population were deemed to be medication related and as a result, significantly had impact to our emergency patient population.

DR. CHARLES TURCK:

I was wondering if you could extend a little bit, you had mentioned that the data thus far has been, or at least before your study had been primarily retrospective, how exactly is that a limitation particularly in this area?

DR. PETER ZED:

There are a couple of reasons why, one of them is just the sheer fact of data loss that we have inherited in a retrospective design in that often times information is inaccurately or not even recorded in a medical record, and that's often times difficult to obtain. Some studies have estimated that about 50% of data can be lost just simply trying to collect it retrospectively. The other big problem is the setting itself. Often times what happens is that decisions about the nature of a visit in the emergency department is often not black and white and clearly what happens on some occasions is in that area of grey zone, there are situations where the diagnosis clearly is not established at the time the patient leaves the emergency department or is admitted to the ward. So for asking for a decision to be made at that point in time is often times difficult and therefore you get misclassification or underreporting. By prospectively evaluating this, you can follow things out further and you can eliminate the problem that can be obtained with loss or inaccurate documentation.

DR. CHARLES TURCK:

In looking at the data that's been published in the past, is there a consistent definition of drug-related adverse events that you find?

DR. PETER ZED:

That's a great question and it's a big problem actually that we have in this whole realm of doing research on adverse events, the terminology and the taxonomy that has been used has been all over the board and most people when they think of drug related problems, they think of the typical side effects of medication, the nauseas, the vomiting, the dizziness, the things that we know happened as a result of taking a medication or a side effect. The more inclusive definition really if we take a step back, we are really interested in things that can go wrong with either the use or misuse of medications, so having a more inclusive definition to encompass things like drug interactions, being on inadequate dose, being on an elevated dose and simply having problems because the patient failed to take a medication are all important. So as a result, you get a more general overview of what really the picture and the magnitude looks like for adverse drug related events and so the terminology we use in our paper and in our study has been used by others as well as is more encompassing of adverse drug related event which includes adverse drug reactions, but also encompasses other things that can go wrong with medication use or misuse.

DR. CHARLES TURCK:

So how was your study conducted, I was wondering if you could give us a couple of more details about the methodology and the specifics involved.

DR. PETER ZED:

Sure, what we ended up doing in our study is we looked at all patients, the study population, all patients that presented to the emergency department over a 12-week period, the study was conducted in Vancouver General Hospital which is a large tertiary care, academic teaching hospital in Western Canada. The population was interviewed prospectively and enrolled into the study by residency

trained clinical pharmacists; they all had some additional training after their undergraduate degree and so they were trained drug experts in assessing patient population and identifying drug-related visits. The patients were interviewed. There was a detailed assessment of their medications and using additional informations such as labs, diagnostics, physical findings, etc. The pharmacist were then able to make determination or not as to the nature of their visit. In many cases, there were grey zones in these presentations, and as a result, the patients were followed prospectively up to 30 days from that point to identify patient that may not have been clear black and white on their initial presentation and as a result the determination of their drug-related association of their visit may not have been actually made at the point in time in the ED, but made at a later point down the road. Despite that there still obviously is grey zone that exists in the determination. So in situations where there was still unclear association between the medication use or misuse in the emergency department visit, we actually compiled an independent adjudication committee that looked at all of these cases independent of the research assistant's determination and they independently looked at all the records, case summary that was created by the research assistant and independently determine whether the visit was drug-related or not. The committee consisted of an emergency physician and a PharmD trained pharmacist, so they had to come up to consensus as to what exactly was the nature of the visit in situations of grey zone.

DR. CHARLES TURCK:

Was there ever a case where you failed to achieve consensus even upon extensive review of the case?

DR. PETER ZED:

There wasn't, all the cases were deemed either drug related or not, there was a causality tool that was used and which assisted both the research assistants at the time that they enrolled the patient as well as the members of the adjudication committee, so there was some certain cut points where they needed to make a determination and if there was still grey zones, the consensus was achieved through discussion, but we ended up characterizing all of the cases.

If you are just joining us, I am your host Dr. Charles Turck, and our guest is Dr. Peter Zed, PharmD, a pharmacy specialist in emergency medicine and an associate professor in the Department of Emergency Medicine in the College of Pharmacy at Dalhousie University in Halifax, Nova Scotia. We are discussing medication-related visits to the emergency department, specifically a journal article that Dr. Zed and his colleagues had published in the Canadian Medical Association journal.

DR. CHARLES TURCK:

Dr. Zed, how large did your study ended up being?

DR. PETER ZED:

We ended up enrolling 1017 patients and it turns out to be one of the largest prospective studies that have been done in this area.

DR. CHARLES TURCK:

Was there a sampling of the total number of patients over a period of time?

DR. PETER ZED:

Yeah, during the 12-week data collection period in the emergency department, there were just under 15,000 visits and so the study was randomly selected using a stratified systematic sampling approach to get a representative sample and from that 15,000 patient visit group just a over 1000 patients were enrolled into the study.

DR. CHARLES TURCK:

What were the exclusion criteria?

DR. PETER ZED:

There were only two, and these are important ones to guess also draw channelization into other emergency departments and the only two patient populations we excluded were people that were brought back to the emergency department for a scheduled visit and patients that may have been transferred to our institution from another facility. Because we were a tertiary care referral center for the province of British Columbia, what we wanted to avoid was to have a situation where it wasn't generalizable to most emergency departments, so we kind of took that specialty population out of the group that were simply there because of the services that are provided in tertiary care center, so as a result, we have created an environment in a patient population that is more generalizable to the general emergency departments whether it be in a small center or in a larger center.

DR. CHARLES TURCK:

What would happen if one of the researchers stumbled upon evidence say of an adverse drug reaction that was unrelated to the patient's chief complaint?

DR. PETER ZED:

They would not be classified as a drug related visit. That was a very key piece of the study in that the patients were only deemed to be medication related if their visit was directly related to a drug-related cause, so for example if the patient presented with a problem with anticoagulation warfarin and their INR was elevated and they presented with a bleeding complication, that clearly related to their presentation, but if the patient had presented with something completely unrelated to their anticoagulation therapy, but it was found that on presentation, their INR was elevated, the certainly wouldn't be classified as being drug related, so there had to clearly be a link between the reason they came into the emergency department and the drug-related association.

DR. CHARLES TURCK:

And what were some of the other measures that you took to ensure that the sample was representative of all ED patients at Vancouver General?

DR. PETER ZED:

It was called a systematic sampling approach and essentially what we ended up doing was randomization of the patient population was carry out for each data collection shift which was about 8 hours in length. Patients were selected after that initial randomization period based on blocks of time so the patients would be selected at each 45-minute block as based on the time that they presented to triage. That would allow us to get a representative sample within that group presenting during that 8-hour period. Obviously emergency departments have different visit rates depending on the day of week and time of day and those are also factors that we took into consideration when we selected our data collection period so that we also ensured that data was collected on patients that presented all times of day and each day of week, so in the end when we looked at our patient population as to some basic parameters to determine if they were like the general population, they were almost identical with regards to gender, age, the number of patients that had a family physician, the number of patients that received multiple medications except the patient populations were very similar to the population we sampled and the general emergency population simply because we took those measures before starting the study.

DR. CHARLES TURCK:

What findings of your study did you find most surprising?

DR. PETER ZED:

The finding we found most surprising was actually one of our secondary end points which was related to the number of patients that required hospitalization, being admitted to a hospital bed and the length of stay of that patient population. Typically in the center where the study was conducted, the rate of hospital admission was somewhere around 23%. When you look at the patient population and we look at the people who are actually admitted to the hospital within our study group, the people that were deemed to have a medication related presentation were almost twice as likely to be admitted to the hospital versus the population that were not there because of a drug related presentation and the patients that were there that were not drug related, actually mimicked the admission numbers that we saw for the general population in general of about 23%. That number went up to about 36% when the patients were drug related. In addition to that, the patients when they were admitted, if they were admitted for a drug-related cause, their medium length of stay was about 3 days longer. So that kind of surprised us and we looked at that and we got the results. We first rerun the results to make sure that those were actually right because it seemed they were surprising to us, but then we thought just about think about it a little bit more and try to explain why that actually happened then we without obviously trying to study that and locate that as a primary objective of the study, one of the explanations could simply have been that these patients often have complex comorbidities, they have complex medication regimens and often times the medication problems that existed requires observation in time to see resolution, so the best place to do that is to actually bring a patient into hospital, stabilize them on the medical therapy and then discharge them so that's the reason we thought without looking at it specifically that's a postulation as to why this may have in fact happened.

We have been talking with Dr. Peter Zed about medication related visits to the emergency department. I am Dr. Charles Turck. You have been listening to Focus on Pharmacy on ReachMD, The Channel for Medical Professionals.

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