Rev. Med. Chir. Soc. Med. Nat., Iaşi – 2010 – vol. 114, nr. 3

COMMUNITY PHARMACY – IDEAL LOCATION TO SCREEN AND MONITOR HYPERTENSIVE PATIENTS

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COMMUNITY PHARMACY – IDEAL LOCATION TO SCREEN AND MONITOR HYPERTENSIVE PATIENTS (Abstract): The goals of this study were (a) to create a patient electronic database by filling in the specially designed Patient Data Sheets (PDS) after interviewing hypertensive patients and (b) to evaluate pharmacists' opportunities for intervention in order to improve hypertensive patients' outcomes. **Material and method**: Pharmacists from two Romanian chain community pharmacies interviewed all hypertensive patients that entered the pharmacies during the study period (November – December 2008) and selected 106 subjects using several selection criteria. Pharmacists recorded in specially designed Patient Data Sheet relevant information such as: demographic data, additional diagnostics (if any), lifestyle behaviors and therapeutic data. The records were then transferred into an electronic database and interpreted by the research team. **Results**: Hypertension (HT) as a single disease was present in only 7 patients (6.6%), most of them being diagnosed with multiple illnesses (such as HT and cardiovascular disease (CVD) in 25 patients, HT and dyslipidemia (DL) in 20 patients). More than half of the subjects (61.3%) declared they have adopted at least one lifestyle modification component and almost 80% of the patients use two, three or more antihypertensive agents in their medication. **Conclusions**: The high incidence of complications among our hypertensive subjects justifies implementing blood pressure monitoring programs in community pharmacies and requires pharmacists' intervention for a better management of hypertension. **Key words**: HYPERTENSION, PATIENT DATA SHEET, LIFESTYLE MODIFICATIONS, MONITORING PROGRAMS

Hypertension (HT) is a major healthcare problem in Romania and one of the most frequent causes of cardiovascular morbidity and mortality. It affects people of all ages, social statuses and professions (1) and initially it causes no symptoms. In the case that some symptoms appear, these are of low intensity and non-specific (2).

HT is also the major risk factor for cardiovascular and cerebrovascular diseases, along with other contributing factors such as: dyslipidemia (DL), diabetes mellitus (DM), obesity, unhealthy diet or sedentary lifestyle (3). Major complications remain uncontrolled or poorly controlled for longer periods of time (4,5). Thus, an optimized control on blood pressure (BP) values is needed to reduce the prevalence of complications. BP values are considered "normal" as long as they are below 140/90 mmHg (in case of a patient with DM or chronic renal disease, the upper limit is 130/80 mmHg) (3,6,7) and "optimal" if they are below 120/80 mmHg (7). Based on evidences, it was found that the cardiovascular disease risk doubles with every increase of

20/10 mm Hg above 115/75 mmHg (1).

Although guidelines recommendations stress for early discovery and aggressive treatment of HT, many studies reported low compliance or poor adherence to therapy (8). Consequently, this determines poor control of BP values and high prevalence of complications. The management of HT in society became an important challenge for the healthcare system (5); identifying patients with high BP represents a major challenge for community pharmacists (5,9). Considered as the most accessible healthcare providers (9), community pharmacists are in a unique position to run screening programs (10). The beneficial of these programs is supported by large scale studies (4) because it was found to improve outcomes and compliance (8). Additional services like blood pressure monitoring and short counseling sessions are also proven to increase patient's compliance (1,11).

Some of the most effective non-pharmacological treatment measures consist in lifestyle changes (7). A healthy lifestyle, as pointed out by the Seventh Report of JNC (Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure), can lower BP values and decrease the progression of HT (6) preventing from complications or delaying them (5,6). Lifestyle changes are strongly recommended to hypertensive patients as well as to people having one or more risk factors (6). Community pharmacists have the opportunity to reinforce the importance of lifestyle changing each month a hypertensive patient refills her/his medication (5,12,13). They should also detect and solve potential drug related problems before they generate adverse reactions and reduce compliance to treatment (9).

Pharmacy based HT screening programs for identifying patients at risk for cardiovascular and cerebrovascular diseases have shown their effectiveness as an important percentage of interviewed patients were referred to physicians with high BP values (4). Equally important, monitoring programs for already diagnosed hypertensive patients contribute to a better management of HT, increase patient motivation and adherence to therapy (8,9,10).

This study was conducted according to law 46 and 667 (14,15).

MATERIAL AND METHOD

The rationale of this study was to pilot a methodology for gathering relevant patient information and to test its usefulness for future interventions in hypertensive patients. The goals were (a) to create a patient electronic database by filling in the specially designed Patient Data Sheets (PDS) after interviewing hypertensive patients by the time they refill their medication and (b) to evaluate pharmacists' opportunities for intervention (education, counseling, monitoring) in order to improve hypertensive patients' outcomes.

During the study period (November – December 2008), pharmacists from two chain community pharmacies have interviewed 106 hypertensive patients. Patients selection followed several criteria: (a) diagnosed with HT for more than 1 year, with no major cardiovascular or cerebrovascular event in the last 6 months; (b) they refill regularly their prescriptions for HT medication (all patients are well known to pharmacy staff for long time), therefore the compliance to treatment can be estimated as good; (c) the HT medication they take didn't changed recently.

Community pharmacists participating in the study followed a short training session where they were explained how to correctly fill in the PDS. They recorded in PDS relevant information such as: demographic data, additional diagnostics (if any), adopted lifestyle modifications (if the case) and therapeutic data.

The main outcome measures of this study

were: HT distribution vs. sex and age, prevalence of complications, lifestyle modification components adopted by patients, prescribed therapeutic classes.

Information recorded in PDS were transferred to an electronic database (Excel workbook) and interpreted by following criteria: distribution of diagnostics among interviewed hypertensive patients, patient behaviors and lifestyle, distribution of HT treatment schemes (how many anti-hypertensive drugs were chosen in patient's treatment) and of therapeutic classes.

RESULTS

The interviewed patients (n = 106, 44 men and 62 women) were previously diagnosed with: HT as single disease (7 patients), HT and diabetes mellitus (DM) (6 patients), HT and cardiovascular disease (CVD) (25 patients), HT and dyslipidemia (DL) (20 patients), HT and DL and CVD (35 patients), HT and other chronic diseases (13 patients). The frequency of diagnostics is presented in fig. 1.

Clinical evidences have been shown that, by adopting lifestyle modifications, hypertensive patients may notice significant decrease of blood pressure values and cardiovascular risk (3,6). The most important changes the patients should adopt would include weight loss (in case of overweight patients), reduction of sodium intake, physical activity, moderate alcohol consumption, smoke cessation (6, 7). When additional conditions occur, further measures might be needed: low fat diet for patients with

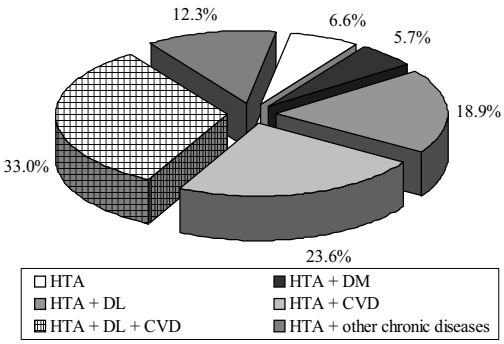

Fig. 1. Frequency of diagnostics at hypertensive patients

DL, low sugar intake for patients with DM.

Sixty-five patients (61.3%) declared they have adopted at least one lifestyle modification component while thirty eight chose to ignore the importance of these measures (fig. 2).

Lifestyle changes that patients in study have adopted are: lowering of sodium intake (57 patients), low fat diet (21 patients), moderation in alcohol consumption (12 patients), weight loss (6 patients), daily physical activity (5 patients) and low sugar diet (5 patients).

When lifestyle modifications cannot reach blood pressure goals, pharmacological treatment is needed. Published studies evidenced that most of the hypertensive patients are treated with more than one antihypertensive agent. The most commonly used medication classes cited by literature are diuretics, beta--blockers, ACE inhibitors, angiotensin II antagonists and calcium channel blockers (6).

Twenty two patients (20.8%) were treated with antihypertensive monotherapy, 45

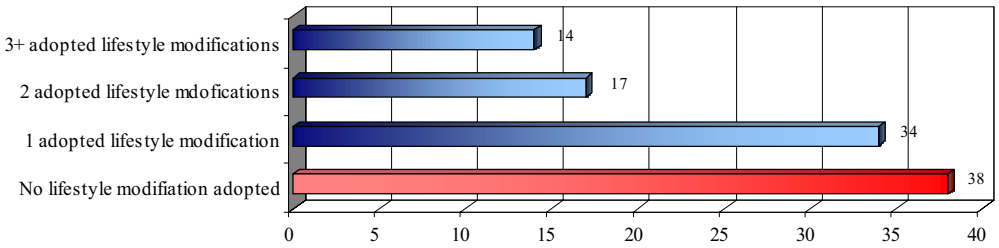

Fig. 2. Patients adopting lifestyle modifications

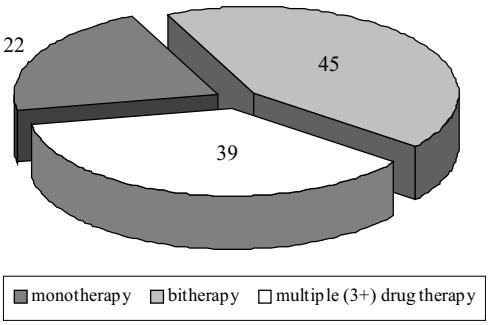

Fig. 3. Pharmacological therapy for hypertension

(42.4%) with bitherapy and 39 (36.8%) with three drugs or even more because of the complications of hypertension (fig. 3).

The most frequently prescribed therapeutic classes were: angiotensin converting enzyme inhibitors (67 patients), diuretics (65 patients) and beta-blockers (60 patients) (fig. 4).

DISCUSSIONS

The hypertensive subjects included in the study were also diagnosed with DM, DL and CVD therefore it should be more useful to have their BP values monitored (in a community pharmacy or by self-monitoring) for a better management of HT. We counted only 7 patients with HT as a single disease, the other 99 patients (93.4%) had additional diseases, most of them classified as risk factors for CVD. Early evaluation of risk factors followed by patient education on dietary regimen, lifestyle changes and pharmacological therapy, would prevent or delay the evolution of complications (7).

The high incidence of complications among our hypertensive subjects justifies implementing BP values monitoring programs in community pharmacies and requires pharmacists' intervention for a better management of HT. In addition, as many of our subjects (36.8%, more than a third) follow a multiple (3+) drug therapy, the probability of drug related problems (DRP) to occur is higher than in other patients. Thus, following programs should also address possible DRP, for the safety of the patients and for a higher, long-term, compliance to treatment.

Behavioral changes that have greater impact on BP values include diet modifications (richer in fruits, vegetables, low-fat products and lower sodium intake), more physical activity and weight loss (5). Although these changes are easy to understand and remember, hypertensive patients have difficulties in applying them over longer time. By involving community pharmacists in supporting patients to maintain a healthier lifestyle, a better control of HT might be achieved (13).

The database we created can be used for future programs where patients shall be closely monitored on how they stick to a healthier lifestyle and follow the treatment

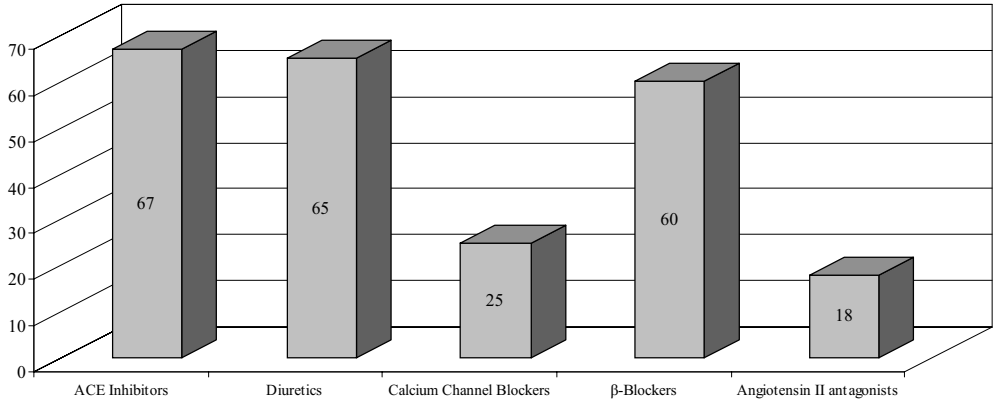

Fig. 4. Antihypertensive therapy – prescribed drug classes

as prescribed. By recording how often patients refill their medication (which medicines are regularly purchased) or if they adjust the dosage on higher/lower BP values (measured with self monitoring devices), pharmacists may evaluate both patient's compliance as well as BP values control. Looking forward, pharmacists may use a quiet space/area in the community pharmacy to measure patient's BP and to perform counseling sessions, as most of the subjects with uncontrolled HT would require closer attention.

The researchers did not aim to screen for uncontrolled BP values on hypertensive patients, therefore BP values were neither recorded nor measured in community pharmacies during this study. The methodology used to build the patient database may be improved by recording additional disease related or treatment related information such as risk factors for HT or CVD, OTC products or natural remedies the patients take on top of their chronic medication.

CONCLUSIONS

HT treatment in Romania follows the most important guidelines recommendations. However, the incidence of complications is extremely high leading to conclusion that HT is poorly controlled. The results of this study suggest that pharmacists can use various intervention strategies like : implementing more lifestyle modifications, BP values monitoring and making patients aware on severity of complications in order to achieve HT treatment goals.

Community pharmacies are some of the most accessible locations to develop pharmaceutical care programs for hypertensive patients due to the fact that community pharmacies are frequently visited by these patients and most of them accept the care and interest that pharmacists show for their medical condition.

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NOUTĂŢI

EFECTUL CONDIŢIONĂRII CU EDTA ÎN CAZUL UTILIZĂRII ADEZIVILOR CE CONŢIN ETANOL

Sistemele adezive cu gravaj acid presupun demineralizarea dentinei şi expunerea colagenului care va fi ulterior infiltrat de răşină. Prin demineralizare, aproape 50% din volumul mineral este înlocuit de apă. Pentru a substitui apa cu răşina hidrofugă, adezivii utilizează un solvent hidrofil. În cazul etanolului, timpul necesar pentru a disloca apa este destul de lung şi creşte cu cât demineralizarea este mai profundă. Pentru a scurta tipul operator autorii studiului propun realizarea unui strat hibrid mai subţire şi mai rezistent, prin demineralizarea dentinei cu EDTA. Rezistenţa adeziunii la tensiune, permeabilitatea interfeţei şi modul în care se produce desprinderea la nivelul ei, au fost evaluate pe secţiuni dentinare umede, condiţionate cu acid ortofosforic, respectiv EDTA, pe care s-au aplicat 5 amestecuri experimentale de monomeri şi etanol şi un adeziv comercial. In vitro, s-au efectuat testarea la microtensiune a secţiunilor longitudinale, examinarea interfeţei după fractură utilizând microscopul stereoscopic, microscopul electronic prin scanare şi microscopul electronic confocal prin scanare iar micropermeabilitatea a fost evaluată prin umplerea camerei pulpare cu o soluţie colorată de rodamină B. Cele mai hidrofobe răşini (similare răşinilor aplicate în etapa finală a sistemelor bi- şi tri-componente) au prezentat valorile cele mai mici ale adeziunii la dentina gravată acid iar probele la care aplicarea s-a făcut pe dentină tratată cu EDTA au cedat prematur la testul de rezistenţă la microtensiune. Una dintre răşinile hidrofile acide testate (similară adezivilor autogravanţi), a prezentat cele mai mari valori ale rezistenţei la microtensiune atât la dentina tratată cu EDTA cât şi la probele gravate acid, în timp ce cealaltă a prezentat o infiltrare redusă atunci când a fost aplicată pe dentina gravată acid. Adezivul comercial testat a prezentat valori mai mari atunci când a fost aplicat pe dentina gravată acid decât pe dentina condiţionată cu EDTA. Testul de micropermeabilitate a demonstrat valori mult mai mici pentru probele tratate cu EDTA pentru 4 din cei 6 adezivi testaţi. Este posibil ca EDTA-ul să denatureze într-o măsură mai redusă colagenul expus şi să determine o dentină mai susceptibilă la impregnare. Rezultatele au demonstrat că utilizarea EDTA-ului pentru condiţionare dentinară ar putea constitui o alternativă promiţătoare a gravajului acid în cadrul tehnicii de adeziune în mediu umed cu răşini dizolvate în etanol. Compoziţia chimică a amestecurilor de răşină reprezintă în continuare un factor determinant al capacităţii de adeziune atât la dentina tratată acid cât şi la dentina tratată cu EDTA. Studiile viitoare vor demonstra dacă acest tip de condiţionare determină o hibridizare dentinară mai rezistentă la solicitările din mediu oral, pe termen lung (Sauro S et al. Resin–dentin bonds to EDTA-treated vs. acid-etched dentin using ethanol wet-bonding. *Dent Mat* 2010 ; 26 (4) : 368-379).

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