

## LETTER TO THE EDITOR

**Pay-for-performance Versus a Budget-Restrictive System for the Management of Dyslipidemia. Should this Approach also be Applied in Hypertension?**Michael Doumas<sup>1,2</sup>, Konstantinos Tziomalos<sup>3</sup> and Vasilios G. Athyros<sup>1\*</sup>

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**Keywords:** Hypertension, lipid targets, pay-for-performance, budget-restrictive system, treatment targets.

The results of the Dyslipidemia International Study (DYSIS) were reported yesterday in the European Society of Cardiology (ESC) congress held at Amsterdam, Netherlands [1]. DYSIS compared low density lipoprotein cholesterol (LDL-C) target achievement in two West European Countries, UK, with an incentive-driven reimbursement system and Germany, with a budget-restrictive healthcare system. Overall, 80% of UK patients achieved the LDL-C target of <100 mg/dL (mean levels 82 mg/dL), compared with just 42% of patients in Germany (mean levels 111 mg/dL), despite the higher use of ezetimibe in the German population than in the UK population (11 vs. 3%). Dyslipidemic patients in the UK were more likely to be treated with potent statins whereas German doctors were more concerned with insurance restrictions than UK physicians [1]. Thus, it seems that lipid targets are more likely to be achieved in clinical practice in pay-for-performance than in budget-restrictive systems, like in Germany [1]. The UK healthcare system makes physicians participate in a clinical audit, and these results are used to assess the quality of care provided. There are no specific quality-improvement strategies in Germany. Interestingly, the German reimbursement for atorvastatin changed in recent years, and many patients were subsequently switched to the less potent simvastatin [1]. A total of 85% of German patients were treated with simvastatin (average dose 27 mg/d) compared with just 66% of UK patients (average simvastatin dose 37 mg/d), while nearly 25% of UK patients were treated with atorvastatin (average dose 34 mg/d) vs. just

4% of Germans who received this higher-potency statin [1]. These despite the fact that the German population had a higher baseline incidence of cerebrovascular disease, peripheral arterial disease and diabetes mellitus; more secondary prevention patients that should achieve even lower LDL-C targets. Since 2005 there is abundant data suggesting a close relation of LDL-C levels with cardiovascular disease (CVD) events, even between two groups on active statin treatment [2]. The Treating to New Targets study showed a significant 22% further reduction in CVD events achieved with 80 mg/d of atorvastatin (mean LDL-C level 77 mg/dL) compared with 10 mg/d of atorvastatin (mean LDL-C level 100 mg/dL) in high risk patients [2]. This was confirmed in the Pravastatin or Atorvastatin Evaluation and Infection (PROVE-IT) Thrombolysis In Myocardial Infarction (PROVE IT)-TIMI-22 study in patients with acute coronary syndromes [3]. This was also verified in March 2013 (in the ACC Congress) by the results of the Ibaraki Cardiovascular Assessment Study (ICAS) in CVD patients with initially low LDL-C [4]. These findings suggest that if you save money today from prescribing a cheaper (and less potent) statin you will pay tomorrow twice as much in costs from CVD fatal and non-fatal events. This was confirmed in The Health Improvement Network (THIN) registry [5,6]. Switching from atorvastatin to simvastatin was significantly associated with increased risk for all CVD events [hazards ratio (HR) 1.30, 95% confidence interval (CI) 1.02-1.64], major CVD events (HR 1.43, 95% CI 1.10-1.87), and stroke (HR 2.14, 95% CI 1.21-3.81). Interestingly, these increased risks were partly attributed to differences in lipid levels and partly to the pleiotropic effects of statins [5, 6].

Arterial hypertension (AH) is a major risk factor for CVD, accounting globally for 51% of stroke and 45% of

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ischemic heart disease deaths [7]. The important question is whether treatment results are similar in antihypertensive treatment as in hypolipidaemic treatment if the pay-for-performance approach is used. In UK, the inclusion of renal-specific indicators in a primary care pay for performance (P4P) system has promoted identification and better management of risk factors related to chronic kidney disease (CKD) since April 2006 [8]. The P4P framework, also known as the Quality and Outcomes Framework (QOF), aims at control of CVD risk factors; one of its key targets is AH. It is clear that AH is a major risk factor for CKD, and consequently CVD [8]. Thus, achieving better blood pressure (BP) control is likely to have a positive impact on both CKD and CVD [9]. BP control was improved since the introduction of P4P and this improvement has been sustained [9]. This was associated with a significant increase in the use of antihypertensive medication, resulting in increased prescription cost (€25/month) [9]. Longer-term follow-up will establish whether or not this translates into improved outcomes in terms of progression of CKD and CVD events [9].

But why to restrict this policy only in hypertensive patients with CKD? AH is a prevalent CVD risk factor with rather disappointing control results. A recent systematic review evaluated data regarding AH control from 35 countries [10]. AH control was achieved in about third of treated patients. In particular, AH control rates were higher in women than in men (36.8% versus 31.9%), and in developed countries compared to developing countries (33.3% versus 29.6% for men, and 38.4 versus 34.0% for women, respectively) [10]. However, when the awareness and treatment of hypertension were taken into account, the true hypertension control rates were substantially lower (16.9% for women versus 10.5% for men) and rather similar in developed and developing countries (17.3% versus 16.2% for men, and 10.8% versus 9.8% for women, respectively) [10]. These incredibly disappointing AH control rates were verified in the Copenhagen City Heart Study, a prospective longitudinal study. During the 25-year follow up period AH control increased from 21% to 26% [11]. Once again however, when control rates were adjusted for AH awareness and treatment, the true AH control rates were improved but remained unacceptably low (4.7% vs. 1.4%). It is therefore of no surprise that 7.6 million premature deaths (about 13.5% of the global total) are attributed to high BP [12].

A study evaluated an intensive protocol-based strategy for achieving BP control in family practice in the Centre for Studies in Primary Care, Queen's University, Kingston, Ontario [13]. There was an improvement between baseline and 12-month follow-up. BP control was significantly better for the intervention group as assessed with both systolic and diastolic mean BP on 24-hour ambulatory BP monitoring [13]. This suggests that an intensive, protocol-based approach to achieve BP control in hypertensive patients in family practice is effective and works even when there is flexibility built into the algorithm to allow family physicians to use their judgment in individual patients [13].

Moreover, data from the REACH Registry, Austrian Chapter, determined the extent of lost therapeutic benefit (LTB) in hypertensive patients, and investigated the relationship between the presence of LTB and clinical outcomes

[14]. Presence of heart failure, previous myocardial infarction and being male decreased the likelihood of LTB, while presence of diabetes, age > 65 and ankle brachial index < 0.90 increased the risk of LTB. Patients with LTB in the age category 55-64 had higher incidence of vascular events compared to those with non-LTB [14].

The pay-for-performance system was introduced in the new General Medical Services contract in the United Kingdom since April 2004, and general practitioners are awarded for the achievement of various clinical targets, including hypertension control [15]. Some reports questioned the effectiveness of the pay-for-performance system on blood pressure control [16,17], however several lines of evidence point towards a beneficial effect of the P4P system on blood pressure management. A large longitudinal survey in over 8,500 general practices in England demonstrated that both blood pressure monitoring and blood pressure control have improved substantially after the implementation of the P4P system [18]. In particular, a mean increase of 6% to 8% in blood pressure control rates was observed in hypertensive patients with or without coronary artery disease, cerebrovascular disease, and diabetes [18]. Another recent study evaluated the effects of pay-for-performance system in Wandsworth, London at 2007 [19]. This interrupted time series study showed that both systolic and diastolic blood pressure were constantly decreasing after the implementation of the pay-for-performance system, for a mean reduction of 5.8 mmHg for systolic and 2.9 mmHg for diastolic between 2003 and 2007 [19]. More importantly, robust epidemiological data confirm the improvements in hypertension control rates in England. The results of the 2006 Health Survey in England revealed that hypertension control rates increased from 22% at 2003 to 28% at 2006, especially in women (from 23% to 32%) [20]. Although several factors might have contributed to this improvement in control rates, it seems very likely that the pay-for-performance system might have exerted beneficial effects.

The pay-for-performance system might also affect the inequalities in primary care delivery. The quality of health services is usually compromised in deprived areas. It has been shown that the financial incentives of the pay-for-performance system have substantially reduced the inequalities in clinical care delivery due to area deprivation, narrowing the gap between the least deprived and the most deprived areas from 4.0% to 0.8% [21]. Similar beneficial effects of the pay-for-performance system might also apply for the ethnic disparities in hypertension management. Although some older studies reported the persistence of ethnic disparities in the management of hypertension [22], more recent studies demonstrate attenuation of ethnic disparities in blood pressure control [19].

In contrast, the removal of financial incentives carries the risk of worsening performance levels. Indeed, a study from the Kaiser Permanente Insurance System in Northern California reveals that when financial incentives for some conditions were removed from some facilities, the level of performance for the detection and control of these conditions declined significantly by about 3% per year [23], while the reattachment of financial incentives was associated with significant improvements.

To conclude, it appears that pay-for-performance, especially based on treatment protocols, may substantially increase BP control with considerable clinical benefits and in a cost-effective way.

#### CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest.

#### ACKNOWLEDGEMENTS

Declared none.

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Received: September 03, 2013

Accepted: September 03, 2013

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