Time Trend Analysis and Variations in Statins Prescribing in the Czech Republic

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Abstract: The aim of the study was to describe the effect of regulatory changes on the development of statins prescribing in individual districts of the Czech Republic. Retrospective analysis of reimbursed medical prescriptions for statins was based on the data from the General Health Care Insurance Company. The situation was assessed in 75 districts starting from the last quarter of 2001 and repeatedly every quarter up to the last quarter of the 2003. Anatomical Therapeutic Chemical Classification system (ATC) and Defined Daily Dose (DDD) as a unit of measurement were used. In the followed up time period the average consumption of statins in DDDs increased 2.12 times. Nearly tenfold variation across the regions in the number of DDDs per 1000 insured persons per day was found ranking from 4.53 to 46.48 in the last quarter of 2001, while corresponding values in 2003 were 6.10 and 37.55. The amount of DDDs was correlated with numbers of practising internist, general practitioners in individual districts in the same time periods. In the observed period opposite trend of the correlation coefficients was noted for internists and GPs. While the correlation of DDD/1000 persons/day to the number of internists decreased over time, the relation to the number of GPs gradually increased. Almost linear trend with gradual increase of the correlation coefficients between DDD/1000 persons/day and the number of insured persons was noted ($T_t = 0.659 + 0.009.t$). Time trend analysis of statins utilization development could help to follow the effect of regulatory changes on its prescribing.

Introduction

Rational use of lipid lowering drugs – statins represents an important and growing part of cardiovascular therapy. Several papers provide description of the utilization of lipid-lowering drugs and their appropriateness of the use patterns as far as effectiveness is concerned [1, 2, 3]. Statins consumption increased 36.1 times and statins expenditure increased approx. 7.5 times in the Czech Republic during 1996–2005 [4]. Large costs of a DDD in the mid-nineties were a ground for a regulatory limitation of prescription right for the specialists in internal medicine only. The restriction of prescription right was completely terminated in the middle of 2001, when new generic statins were introduced into the national market. The analysis of package price vs. DDD/1000 inhabitants shows exponential decline of the costs over 2000–2005 [4].

The aim of the study was to describe the effect of regulatory changes on the development of statins prescribing in individual districts of the Czech Republic.

Methods

Retrospective analysis of reimbursed medical prescriptions for statins was based on the data from the largest Health-Care fund (General Health-Care Insurance Company) covering around 70% of the population. Anatomical Therapeutic Chemical Classification system (ATC) and Defined Daily Dose (DDD) as a unit of measurement were used [5]. Reimbursed prescription of the dispensed statins

(C10AA), number of packages and number of DDDs dispensed were used from the database. The utilization was assessed in 75 districts of the Czech Republic representing the whole area of the country quarterly in the period from the last quarter of 2001 up to the last quarter of the 2003. Statins consumption was expressed in DDD/1000 insured persons/day. The relationship of the amount of DDDs with numbers of practising internist, general practitioners and insured persons was evaluated in individual districts over the time periods. Time-series analysis of the regression coefficient was performed by linear regression model and smoothing (Statgraphics Plus for Windows).

Results

Average consumption of statins in DDDs increased 2.12 times between the last quarter of 2001 and the last quarter of the 2003 in the population insured by the General Health-Care Insurance Company (Table 1). Nearly ten-fold variation among the districts in the number of DDDs per 1000 insured persons per day was found ranking from 4.53 to 46.48 in the last quarter of 2001 and slightly lowered over time to the corresponding values 6.10 and 37.55 in 2003. Consumption in DDDs was correlated with the number of practising internist and general practitioners (Figures 1 and 2). In the observed period opposite trend of the correlation coefficients was noted. Correlation coefficient decreased in the case of internists, while in the case of GPs gradually increased from the last quarter of 2001 up to the first quarter of the 2003. Almost linear trend ($T_t = 0.659 + 0.009.t$) with gradual increase of the correlation coefficients of DDDs to the number of insured persons was noted over the time (Figure 3).

Discussion

Similarly to most of other countries, utilization of statins in the Czech Republic has increased considerably during few recent years [6]. This development brought about specific medical, social, and economic consequences. We followed the effect of regulatory limitation of statins prescribing on its utilization.

The present study described population-based prescription data, obtained from the largest Health-Care fund (General Health-Care Insurance Company), of statins utilization in region-specific evaluation. The analysis revealed large variability of statins prescribing among separate regions in the years 2001–2003. Statins utilization in DDDs per 1000 insured persons per day were approximately 5–10 times lower

Table 1 – Statins consumption expressed in DDD/1000/day in the period 2000–2003

	2000	2001	2002	2003
Average	6.68	10.10	11.16	14.19
SD	3.50	5.12	4.35	4.91

DDD – defined daily dose

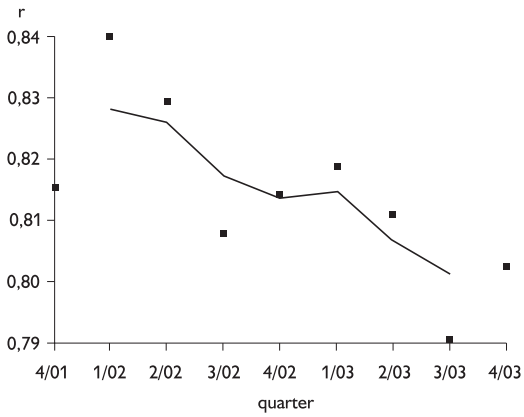

Figure 1 – Correlation coefficients of consumption in DDDs/1000 patients/ day with the number of practising internists. Line was obtained by smoothing.

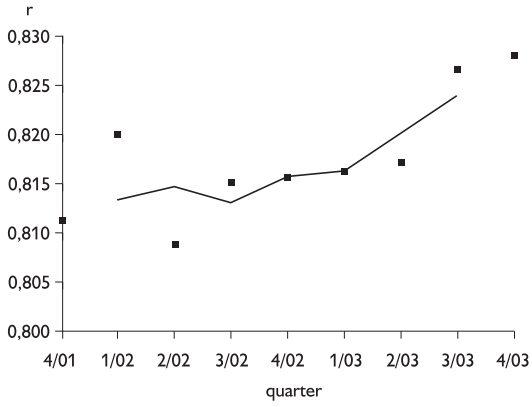

Figure 2 – Correlation coefficients of consumption in DDDs/1000 patients/ day with the number of general practitioners. Line was obtained by smoothing.

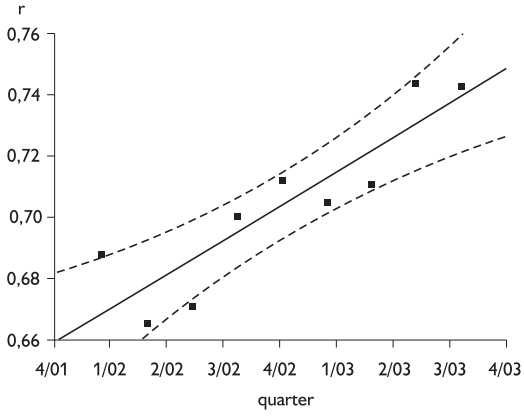

Figure 3 – Correlation coefficients of consumption in DDDs/1000 patients/ day with the number of insured persons. Line represents linear trend ($T_t = 0.659 + 0.009.t$) and 95% confidence interval.

in our country, when compared to the consumption in Australia and Canada in the year 2001 [7]. Drug utilization of statins in 2003 was in our analysis 7 times lower than in Norway, [8].

Deregulation of prescription led to the increased correlation of statins utilization to number of practising GPs, whereas the relationship of statins consumption to the number of internal medicine specialists slightly weakened. Relative increase in prescription of statins by GPs occurred with almost two years lag time illustrating combination of variety of factors like availability of new clinical data on benefits with statins use and their spread to the population of GPs, but probably also some inertial behaviour of practising physicians with respect to the marketed products. However, the intent of the study was not to evaluate these additional factors such as advertising, detailing, insurance coverage and all individual patients' data covering age, gender, and co morbidity.

The utilization of statins showed increased dependency to the number of practising GPs over time, but surprisingly this remains only a relative relationship, because the correlation of drug consumption vs. number of patients increased linearly and did not display any significant signal of higher usage of the drug, when wider prescription by GPs was induced. Therefore, the shift in prescription of statins from specialists to GPs does not seem to substantially change the accessibility of patients to statins medication, but our study has not been designed to demonstrate equality of accessibility to medications or health care either in different regions of the country or during the time.

Conclusion

The present study has emphasized the importance of following the statins utilization development, which could help to follow the effect of regulatory changes on its prescribing. This may contribute to improve practices of evidence-based usage of this important group of drug.

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