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Research of Variation in Price of Antidiabetic Drugs in The Pharmaceutical Market of Ukraine.

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ABSTRACT

There are large number of peroral antidiabetic drugs with wide price variations in the pharmaceutical market of Ukraine. OBJECTIVE. Evaluation of the price variations of different antidiabetic drugs in the pharmaceutical market of Ukraine. MATERIALS AND METHODS: 1) retrospective analysis of 1792 inpatient's medical histories with T2DM; 2) frequency analysis of the used treatment regimens; 3) ATC/DDD-methodology; 4) cost minimization analysis. The percentage of cost variation was calculated as follows: Cost Variation (%) = Max cost – Min cost / Min cost x 100 % [3]. Spearman correlation analysis shows the correlation between number of manufacturing companies and percentage of cost variation of their antibiabetic drugs. Statistical data processing is performed by the software Microsoft Excel 2007. RESULTS AND DISCUSSION. Treatment regimens with metformin, glimepiride and gliclazide has been selected for research. DDD of drugs was studied by ATC/DDD-methodology. Spearman rank correlation of the investigated treatment regimens indicates the weak negative association between the number of manufacturing companies and the percentage of cost variation ($p>0.05$). Using the result of the cost minimization analysis will save families or governmental budget: used metformin can make the cost savings in a 3.4 %, glimepiride – in a 2 %, gliclazide in a – 2.4 %. CONCLUSION: Our results are different from studies Falguni M. Chavda, Brijalkumar S. Patel and Shailesh G. Mundhava [2], we have received a weak negative association between the number of manufacturing companies and the percentage of cost variation of peroral hypoglycemic drugs that were selected for the investigation. Probably, it is associated with small number of manufacturers of antidiabetic drugs in the pharmaceutical market of Ukraine and, maybe, distortion of lows of the market and competition in condition of political and economic instability of the country.

Keywords: pharmaceutical market, peroral antidiabetic drugs, the percentage of cost variations, Spearman rank correlation

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INTRODUCTION

T2DM is a chronic pathological condition which can result in disability and early death. Antidiabetic drugs are commonly used to diabetes management [1]. There are a lot of generics and manufacturing companies of antidiabetic drugs in the pharmaceutical market of Ukraine. Their number varies from year to year. On the laws of the market increase the number of generics and drug manufacturers should lead to change prices for them. It is very interesting how change the lows of the market in condition of political and economic instability of the country.

OBJECTIVE:

Evaluation of the percentage of cost variations of antidiabetic drugs in the pharmaceutical market of Ukraine.

MATERIALS AND METHODS

1) retrospective analysis of 1792 inpatient's medical histories with T2DM; that were treated at the endocrinology clinics of Podolsky region of Ukraine in 2011-2013; the exclusion criteria were: the patients that were received insulin, the patients with complication as the diabetic foot steps of II-V stages, the patients with heart failure of III stage; old patients more than 75 and young patients before 30 years;
2) frequency analysis of the used treatment regimens;
3) ATC/DDD-methodology;
4) cost minimization analysis. Cost of DDD was calculated according to information of the price list of the largest national distributor in pharmaceutical market "BADM" from the 12.06.2014. This supplier was selected for the research because it occupies 40% of the regional pharmaceutical market of Ukraine. The percentage of cost variation was calculated as follows: Cost Variation (%) = Max cost – Min cost / Min cost x 100 [3]. Spearman correlation analysis shows the correlation between number of manufacturing companies and percentage of cost variation of their antibiabetic drugs. Statistical data processing is performed by the software Microsoft Excel 2007. Cost minimization analysis shows the possibility of cost savings. The cost savings were calculated as follows: Cost savings (in UAH) = Max cost – Min cost of the peroral antibiabetic drugs in pharmaceutical market of Ukraine.

RESULTS AND DISCUSSION

It has been found that in the pharmaceutical market of Ukraine drugs of ATC group A10 – antidiabetic drugs were presented. The group of peroral hypoglycemic drugs includes biguanides, sulfonylureas, combination of oral hypoglycemic drugs, alpha-glucosidase inhibitors, thiazolidinediones, inhibitors of dipeptidyl peptidase-4, and other peroral hypoglycemic drugs.

As a result of the spent frequency analysis of the used treatment regimens it has been established that monotherapy was used in 25 % of cases. Our previous study [4] has demonstrated the pharmacoeconomical benefits of the treatment regimens of monotherapy with metformin (which accounted for 16% of cases), glimepiride (which accounted for 5% of cases) and gliclazide (which accounted for 4% of cases). So, metformin, glimepiride and gliclazide have been selected for the research.

According to the ATC/DDD-methodology DDD of metformin is 2000 mg, gliclazide – 60 mg, glimepiride – 2 mg [2]. Pharmaceutical assortment of peroral antidiabetic drugs, manufacturers, minimum and maximum costs of generics in pharmaceutical market of Ukraine have been established in price list of the largest national distributor (Table 1).

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Table 1: Variation in price of peroral antidiabetic drugs in the Ukrainian pharmaceutical market

INN antidiabetic drugs	Years of research	Number of trade names (generics)	Number of manufacturers	Minimum cost, UAH	Maximum cost, UAH	Percentage of cost variation, %
metformin	2014	33	7	1.55	5.46	252
	2013	32	7	1.46	3.98	173
	2012	22	9	1.39	3.61	160
	2011	23	7	1.28	3.05	138
glimepiride	2014	19	9	1.06	3.42	242
	2013	19	8	0.68	2.28	235
	2012	27	9	0.67	2.24	234
	2011	23	9	0.66	1.88	185
gliclazide	2014	5	3	1.26	3.97	297
	2013	5	3	0.42	2.63	526
	2012	7	4	0.37	2.03	449
	2011	7	5	0.31	1.62	423

Spearman rank correlation *of metformin* was rs = – 0.0333 (p>0.05), of *glimepiride* was rs = – 0,0333 (p>0.05), of *gliclazide* was rs = – 0.0583 (p>0.05).

So, it is indicates the weaker negative association between the number of manufacturing companies and the percentage of cost variation of peroral hypoglycemic drugs that were selected for the investigation.

As a result of the cost minimization analysis of the cost savings were calculated. Cost savings per 1 day were: for 1 patient who are used metformin – 3.91 UAH, glimepiride – 2.40 UAH, gliclazide – 2.71 UAH. Cost savings per 1 year were: for 1 patient who are used metformin – 1427.15 UAH, glimepiride – 876 UAH, gliclazide – 989.15 UAH. The average salary in Ukraine in 2014 was 41641 per year. Using result of the cost minimization analysis will save families or governmental budget: in case of metformin the cost savings can be 3,4%, glimepiride – 2 %, gliclazide – 2.4 %.

Thus, the cost savings of families or government budget in diabetes treatment may be 3,4% in case of metformin use, 2% in case of glimepiride use, and 2.4% in case of gliclazide use.

CONCLUSION

We received a weak negative association between the number of manufacturing companies in the pharmaceutical market of Ukraine and the percentage of cost variation. Our results are different from studies Falguni M. Chavda, Brijalkumar S. Patel and Shailesh G. Mundhava [2]. Probably, it is associated with a small number of manufacturers of peroral antidiabetic drugs in the pharmaceutical market of Ukraine and, maybe, distortion of lows of the market and lows of the competition in condition of political and economic instability of the country.

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