

Marketing Analysis of the Pharmaceutical Market of Drugs for Weight Disorder Treatment

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Abstract—The article presents the results of a marketing research of the Russian pharmaceutical market of drugs for the treatment of weight disorders - overweight and underweight. Macrocontours have been developed, the main trends in market formation have been identified.

Keywords—*weight disorders, malnutrition, underweight, overweight, marketing research of the pharmaceutical market, macro-contour of the market*

I. INTRODUCTION

Weight loss in recent decades has become one of the most important problems for residents of most countries of the world. Recent World Health Organization data indicate an increase in the number of people suffering from weight disorders. So, in particular, more than 1.9 billion (39.0%) of adults aged 18 years and older are overweight, in the child population - 42.0 million children under the age of 5 years are overweight or obese [1]. 42.0 million children under 5 years old are currently overweight or obese in Russia. Among the population of Russian teenagers aged 12–17 years, 11.6% are overweight, of which 2.3% are obese [2].

Meanwhile, excessively low body weight is also a threat to human health. So, in particular, the prevalence of malnutrition among children of the first 3 years of life in different countries is in the range of 7-30%, and mortality in the severe degree of this state reaches 30.0%. [3]. According to the Rospotrebnadzor of the Russian Federation, 19.0% of children and adolescents are underweight, severe malnutrition is diagnosed in approximately 1.0-2.0% of children.

The epidemic increase in weight disorders in all age groups, including children, accompanied by an increase in metabolic and cardiovascular disorders associated with an increased risk of early disability and mortality. It justifies the urgency of taking measures aimed at eliminating these pathological conditions [4,5,6].

Pharmacotherapy of overweight and underweight

involves the use of a significant range of drugs as part of complex treatment [7,8]. Thus, it is relevant to study the range of drugs registered on the pharmaceutical market of Russia for the treatment of the above mentioned nosologies and to determine the main trends in the formation of the market.

The aim of the study is a marketing research of the Russian pharmaceutical market for the treatment of weight disorders.

II. EXPERIMENTAL

The materials for the study were official sources of information on registered and approved for medical use drugs in the Russian Federation such as the State Register of Medicines and Medical Devices, the Encyclopedia of Medicines, the Register of Medicines of Russia, the Vidal, Medicinal Products in Russia, M.D. Mashkovsky "Medicines"; Directory of synonyms for drugs; Internet resources; Price lists of pharmaceutical distributors (ZAO NPK "Katren", ZAO "Protek", OOO "Pulse"); software "Analit-pharmacy".

Methods of systemic, structural, segmentation, graphic, content analysis, economic and mathematical (comparisons, groupings, ranking) were used in the study.

III. RESULTS AND DISCUSSION

To achieve the goal, 2 stages research concept has been developed that includes: conducting a marketing research of the Russian pharmaceutical market for the treatment of overweight; conducting a marketing research of the Russian pharmaceutical market for the treatment of malnutrition (underweight).

At the first stage, as part of a marketing research of the Russian pharmaceutical market for the treatment of overweight, an informational array of drugs was formed by content analysis of data from official sources of information on drugs. The array structure includes: international nonproprietary name (INN), trade name (TN), drug code

according to ATC classification, drug composition, manufacturer, dosage form, registration number.

It has been established that the Russian pharmaceutical market is represented by 94 INN, 143 TN of drugs and 388 drugs for overweight treatments, taking into account all forms and dosages.

During the structural analysis, it has been revealed that the assortment structure is formed by 4 pharmacotherapeutic groups of drugs according to the ATC classification, used to treat overweight, as well as nutritional supplements and homeopathic remedies. Among them, the leading position is occupied by drugs acting on the nervous system (group N) - 58.9% in the number of drugs and 37.1% in the number of trade names. The second position is occupied by the drugs that affect the digestive tract and metabolism (group A) - 19.6% and 24.5%, respectively, and nutritional supplements are in third position, 16.8% and 32.9%, respectively. In addition, the range of drugs for the treatment of hypertrophy includes such classification groups as agents that affect the respiratory system (group R) (0.5% by the number of drugs); drugs acting on the cardiovascular system (group C) and homeopathic remedies (2.1% by the number of drugs) (table I).

In order to study more detail, an intragroup analysis of the assortment of drugs used to treat weight disorders was carried out. In particular, during the study of group N - "Nervous system", it has been found that 6 subgroups form it. The leading position is occupied by the subgroup N06B - "Psychostimulants and nootropic drugs", which in terms of the number of drugs makes up 21.4%, in trade names - 3.5%. The second ranking position is occupied by group N06A "Antidepressants" - 15.46% and 15.4%, respectively. Third position belongs to group N05B - "Anxiolytics" - 8.0% and 9.1%. The group includes drugs for the treatment of the nervous system: Hypnotics and sedatives - 8.0% and

4.2%; Antipsychotic drugs - 4.38% and 3.5%; Other nervous system drugs - 1.80% and 1.40%, respectively.

The study based on production characteristics of drug assortment was carried out further. During the analysis, it has been found that Russian-made drugs predominate in the assortment structure - 62.4% (242 drugs), foreign drugs account for 37.6% (146 drugs). There are offers of 23 foreign countries. The leading position among foreign manufacturers is occupied by India - 23 drugs (5.93%), the second position belongs to the USA - 17 drugs (4.38%), the third - to Germany with 16 drugs (4.12%). While segmenting the drug assortment by composition, it has been found that mono-component drugs account for 72.68%, combined drugs for the treatment of overweight account for 27.32% (106 drugs) of the total assortment.

As a result of segmentation of drug assortment for overweight by dosage forms (DF), it has been revealed that the structure is formed by 2 types of DF: solid 79.12% and liquid 20.88%. Capsules prevail (29.0%) among solid DFs and followed by tablets (22.2%), then by film-coated tablets (12.4%), and coated tablets 8.5%. Among liquid drugs, the dominant ones are: drops for oral administration - 39.5%; solutions for intramuscular and intravenous administration - 35.8%, liquid for oral administration - 4.9%.

Analysis of registration numbers revealed that for the period from 2011 to 2018 142 new drugs for the treatment of overweight appeared on the pharmaceutical market of the Russian Federation. The renewal coefficient (I_o) is 0.37, which may indicate the interest of manufacturers in this group of drugs and indirectly the growth in demand for them in the pharmaceutical market.

A macro-contour of Russian pharmaceutical market has been formed for the treatment of overweight, which is represented mainly by drugs for the treatment of the nervous

TABLE I. THE STRUCTURE OF DRUG ASSORTMENT USED FOR THE TREATMENT OF OVERWEIGHT, IN THE RUSSIAN PHARMACEUTICAL MARKET ACCORDING TO THE ATC CLASSIFICATION

Name of drug classification groups	Number of items												
	INN		TN		Drugs								
	number	share, %	number	Share, %	Total			Russian		Foreign		New, amongst others	
					number	Share, %	Rank	number	Share, %	number	Share, %	number	I_o
1. Digestive and metabolic agents (A)	14	14,90	35	24,50	76	19,60	II	38	50,00	38	50,00	30	0,40
2. Drugs affecting the cardiovascular system (C)	2	2,10	2	1,40	8	2,10	IV	8	100,00	-	-	2	0,25
3. Drugs for the nervous system (N)	34	36,20	53	37,10	229	58,90	I	153	66,80	76	33,20	65	0,28
4. Respiratory system medications (R)	1	1,10	1	0,60	2	0,50	VI	2	100,00	-	-	1	0,50
5. Nutritional supplements	38	40,40	47	32,90	65	16,80	III	35	53,80	30	46,20	40	0,62
6. Homeopathic remedies	5	5,30	5	3,50	8	2,10	IV	6	75,00	2	25,00	4	0,50
Total	94	100,00	143	100,00	388	100,00		242	62,40	146	37,60	142	0,37

system (58.9%), the leading position among which is occupied by psychostimulants and nootropics (21.4%). By production characteristics, Russian-made drugs predominate (62.4%) in the form of monocomponent medications (72.7%) in a solid dosage forms (79.9%), mainly in the form of capsules (23.0%). The share of new drugs for the treatment of overweight for the analyzed period is 37.0% (Fig. 1).

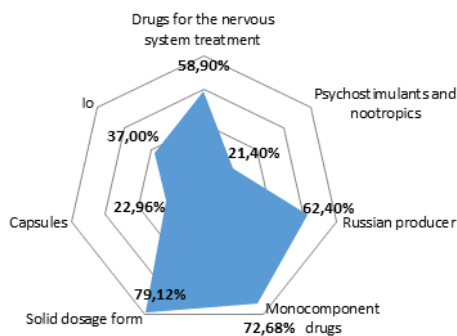


Fig. 1. Macrocontour of the Russian pharmaceutical market for the overweight treatment.

At the next stage, a marketing analysis of the Russian pharmaceutical market for the treatment of malnutrition was carried out. It is revealed that 89 INN, 140 TN and 390 drugs for the treatment of underweight have been registered on the Russian market.

The structure of drug assortment for the treatment of underweight is represented by 8 classification groups. The first position among them is occupied by drugs acting on the nervous system (group N) - 58.97% according to the number of drugs and 37.14% according to the number of trade names. They are followed by the drugs that affect the digestive tract and metabolism (group A) - 23.3% and 24.3%, respectively, and the third position belongs to

nutritional supplements- 9.74% and 22.14%. There are other products of the pharmacy assortment that is used in the treatment of underweight. They are represented by remedies for enteral and parenteral nutrition - 3.85% and 10.71%; drugs affecting the cardiovascular system - 1.54% and 0.71%, homeopathic medicines - 1.03% and 2.14%, drugs affecting the respiratory system - 1.03% and 1.43% and drugs affecting blood and blood forming organs - 0.51% of drugs and 1.43% of TN (table II).

In a detailed intragroup study of drugs for the treatment of underweight, it was noted that drugs acting on the nervous system (group N) is represented by 5 subgroups. The first position is occupied by the subgroup N06B - "Psychostimulants and nootropic drugs", which in terms of the number of drugs is 22.8%, trade names – 4.3%. The second position is occupied by the N06A group - "Antidepressants", comprising 14.1% and 14.3%; the third position belongs to the N05B group - "Anxiolytics" - 7.95% and 9.3%, respectively. The assortment of this group of drugs includes also hypnotics and sedatives - 7.95% and 4.3% and antipsychotic drugs - 6.15% and 5%, respectively.

During segmentation of the drug assortment for the treatment of malnutrition by production criteria, it has been found that Russian-made drugs prevail in the structure of the assortment and comprise 58.46% (228 drugs); foreign drugs present by 41.54% (162 drugs).

Proposals of 29 foreign countries have been registered at the Russian pharmaceutical market, among which Germany occupies the leading position with 17 drugs (4.3%), the second position belongs to India with 16 drugs (4.1%), and 13 drugs (3.3%) is from each of the country: Hungary, Republic of Belarus and Denmark.

The prevailing share of the assortment for the treatment of malnutrition is multicomponent drugs - 70.26% (274 drugs); the combined drug share is 29.74% of the total assortment (116 drugs).

TABLE II. THE STRUCTURE OF DRUG ASSORTMENT USED FOR THE TREATMENT OF UNDERWEIGHT IN THE RUSSIAN PHARMACEUTICAL MARKET ACCORDING TO THE ATC CLASSIFICATION

Name of drug classification groups	Number of items												
	INN		TN		Drugs								
	number	share, %	number	Share, %	Total			Russian		Foreign		New, amongst others	
					number	share, %	rank	number	share, %	number	share, %	number	I _o
1. Digestive and metabolic agents (A)	24	26,97	34	24,30	91	23,33	II	57	62,64	34	37,36	24	0,26
2. Drugs affecting Blood and blood forming organs (B)	2	2,25	2	1,43	2	0,51	VIII	1	50,00	1	50,00	1	0,50
3. Drugs affecting the cardiovascular system (C)	1	1,12	1	0,71	6	1,54	V	6	100,00	-	-	2	0,33
4. Drugs for the nervous system (N)	33	37,07	52	37,14	230	58,97	I	143	62,17	87	37,83	61	0,27
5. Respiratory system medications (R)	2	2,25	2	1,43	4	1,03	VII	2	50,00	2	50,00	1	0,25
6. Nutritional supplements	16	17,97	31	22,14	38	9,74	III	17	44,74	21	55,26	28	0,74
7. Homeopathic remedies	3	3,37	3	2,14	4	1,03	VI	2	50,00	2	50,00	2	0,50
8. Other products of pharmaceutical assortment	8	9,00	15	10,71	15	3,85	IV	-	-	15	100,00	4	0,27
Total	89	100,00	140	100,00	390	100,00		228	58,46	162	41,54	123	0,32

The structure of drug assortment by type of dosage form is represented by solid (66.92%), liquid (32.05%) and soft ones (1.03%). Tablets predominate among solid DFs (26.1%), followed by film-coated tablets (16.5%) and capsules (15.3%). Most of the liquid dosage forms are represented by solutions for intravenous and intramuscular administration (10.8%) and drops for oral administration (6.92%). The group of soft DF is represented only by rectal suppositories (1.03%).

Analysis of registration numbers revealed 123 new drugs for the treatment of underweight. The coefficient of renewal (Io) of drug assortment is 0.32, which also indicates the development trend of this segment.

A macrocontour of the Russian pharmaceutical market for the treatment of underweight has been formed based on the study. IT is represented mainly by drugs for treating the nervous system (58.97%), with a leading subgroup of psychostimulants and nootropic drugs (22.8%), with Russian-made drugs predominate (58.46%), in the form of monocomponent medications (70.26%), in a solid dosage forms (66.92%), mainly in the form of tablets (17.4%). The degree of updating the assortment is 32% (Fig. 2).

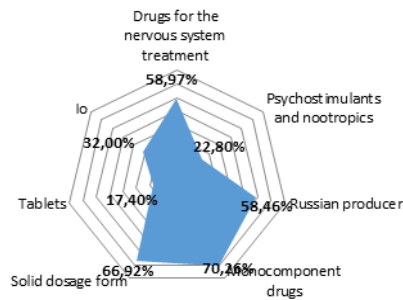


Fig. 2. Macrocontour of the Russian pharmaceutical market for the treatment of underweight.

IV. CONCLUSION

The results of the study form the basis for the formation of marketing proposals for optimizing the assortment of drugs for the treatment of weight disorders in the Russian pharmaceutical market, in particular, an increase in the number of drugs for children, including innovative ones produced in children's dosage forms. Also, the results can be used to conduct a comparative analysis of trends in the formation of regional drug markets for the treatment of weight disorders.

REFERENCES

- [1] S. Vandevijvere, C.C. Chow, K.D. Hall, E. Umali, B.A. Swinburn "Increased food energy supply as a major driver of the obesity epidemic: a global analysis", *Bulletin of the World Health Organization*, Vol. 93, N 7, 2015, p.446-456.
- [2] R.M. Akhmedova, "The prevalence and gender characteristics of obesity in adolescents of Perm", *Voprosy sovremennoy pediatrii*, vol.5 (13), pp. 37, 2014.
- [3] S. Vandevijvere, C.C. Chow, K.D. Hall, E. Umali, B.A. Swinburn "Increased food energy supply as a major driver of the obesity epidemic: a global analysis", *Bulletin of the World Health Organization*, Vol. 93, N 7, 2015, p.446-456
- [4] L.V. Savelyeva, "The modern concept of obesity treatment", *Obesity and metabolism*, vol. 1, pp.51-56, 2011.
- [5] A.L. Rakov, "Metabolic syndrome and obesity", *Novaya apteka*, vol. 6, pp. 20-22, 2012.
- [6] G. Twig, G. Yaniv, H. Levine, A. Leiba, N. Goldberger, E. Derazne, D. Ben-Ami Shor, D. Tsur, A. Afek, A. Shamiss, Z. Haklai, J.D. Kark, "Body-mass index in 2,3 million adolescents and cardiovascular death in adulthood", *N Engl J Med.*, vol.374 (25), pp.2430-2440, 2016.
- [7] Rakov A.L., "Pharmacotherapy for Obesity", *Novaya apteka*, vol. 6, pp. 22-24, 2011.
- [8] M.S. McDonagh, S. Selph, A. Ozpinar, C. Foley, "Systematic review of the benefits and risks of metformin in treating obesity in children aged 18 years and younger", *JAMA Pediatr*, vol.168(2), pp. 178-184, 2014.