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Duodenal Antifatigue Hormonal Factor

**Origin and Treatment
of Digestive Fatigue Syndrome
and Other Food-Related Disorders**



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Duodenal Antifatigue Hormonal Factor. Origin and Treatment of Digestive Fatigue Syndrome and other Food-Related Disorders

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To
My Dear Robert and Galina

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Preface

Throughout the ages and until the present day one of the most prevalent observed disorders of the organism is fatigue condition (also known as fatigue syndrome, asthenia, weakness etc.); however, the essence and methods of effective prophylaxis and treatment of this suffering has not been resolved.

In this work, I have tried to present this problem from a new point of view. During my over twenty years as chief of the clinic, I and my coworkers in the Ukrainian Research Center of Gastroenterology and in a research project "Adaptive peptides," including gastroenterologists, pharmacologists, veterinarians, and biochemists, had studied the role of gastroduodenal hormones in pathogenesis and treatment of digestive diseases. As a result of many years of research conducted on farm and laboratory animals and patients in the clinic, it was possible to bring to light the real mechanism of a **close connection between digestion and fatigue**, which has been observed for centuries.

It is well known that many people suffer from the fatigue syndrome after food intake. Yet in the nineteenth century, this syndrome was called by different names: "dyspepsia asthenic", "digestive fiber", "neural dyspepsia", and "stomach neurasthenia". This syndrome is observed very clearly after stomach resection, and is known by the name of "dumping syndrome." Specifically, in those patients with reduced gastroduodenal hormones, I, for the first time, have discovered that introduction of secretin (a natural extract of the duodenum) prevented patients from suffering from this pathological post-nutrition syndrome and was accompanied by evident and remarkably rapid healing effect.

Keeping in mind that secretin, which we used, was not a pure preparation, it is natural to presume that it could contain some other substance. The observed protective effect can be due to some hitherto unknown property of secretin or

even due to some yet unknown substance (hormone), which could be identified in the future.

Thus, we have determined the previously unknown fact that the digestive system produces a hormonal factor protecting the organism from fatigue connected with digestion.

In my paper presented in 1975, I called this disorder "syndrome of dishormonal digestive asthenia." In the following years, our studies broadened our understanding of the antifatigue function of the duodenum and its role in the pathogenesis and treatment of this syndrome. One thing is certain - that we are dealing with Fatigue Prevention Factor (FPF). Its deficiency is the cause of the very widespread pathology which I described.

This term characterizes the pathological syndrome more accurately than the previous one.

The powerful protective effect of FPF is defined by its replacement action, i.e., it exogenously liquidates its endogenic deficiency.

As with all endocrine diseases, the instant treating effect proves its hormonal genesis.

Thus for the first time, the origin and principles of effective treatment of this widespread clinic form of the fatigue condition of the organism have been established.

Fatigue prevention factor could be used in many diseases and for the adaptation of the organism to extreme situations (space, travel, sports, army etc). The result of our studies in veterinary medicine, oncology, and stress confirms this possibility. In order to achieve this goal it is necessary to work out appropriate medical preparations. The technological principles of the production of these preparations (for sublingual, intranasal, and injection introduction) have also been established.

In this book, we also underline the significance of the antifatigue function of the duodenum in the manifestation of fatigue action of food products and the well-known role of food in many diseases, including cancer.

It seems totally incredible that these two concepts - fatigue and food – might in some way be related, for we used to

associate food with strength, with life energy, and now we must speak in terms of weakness and fatigue.

Many people used to limit their food intake before intense mental and physical work. E. Wilow writes: "The reason for constant fatigue is very often seen elsewhere, when in fact it is caused by incorrect nutrition." An old saying goes: "No meal – no strength, after meal – got sick."

These examples from everyday life might be multiplied. At the same time, many clinical observations and experiments on animals prove that food intake and digestion weaken the individual, decreasing his resistance. This can be seen from numerous experiments which prove that at times, nutrition assists in the emergence of diseases and diminishes the stability of the individual.

All of this reveals a new way of fighting diseases and of developing new dietary regimens for health and sickness. For centuries, the struggle against the pathological reaction of the individual to food was limited to the introduction of a diet and the protecting of the individual from certain kinds of food products: "Don't eat this, it is forbidden." This appeal, constant and adjusted to fashion, is constantly heard, read, seen on television.

Undoubtedly, this limited principle plays a certain role in protecting the individual from the pathogenic effect of food. Unfortunately, however, the dietetic protection of the individual has thus far not solved the problem of preventing the potential damaging effect of food products. It is unlikely that in the near future, we will thoroughly comprehend the character of this effect of certain food ingredients, let alone their various combinations. It is especially unlikely when we take into consideration the culinary traditions among various peoples. We hope that our book will be helpful to new research on this very important problem.

In the appendix, my first publications on this problem are placed. Those scientific papers are in Russian with English summaries. They give the readers an opportunity to get an understanding of when and under what circumstances the author saw the problem of digestive fatigue syndrome and the

anti-fatigue function of the duodenum from the very beginning, which has received final illumination in this book.

In my work I was assisted by my coworkers at the clinic – Dr. Lidia Melnichenko, Dr. Inna Sheleketina, Dr. Svetlana Yagmur, Dr. Veronica Dormostuk, Dr. Ninel Chebikina, Dr. Lena Bogdanovich, Dr. Lyuda Averianova and members of the research project “Adaptive peptides“: oncologists Dr. Layma Griciute, Dr. Vitas Sniras, veterinary doctors Adolfas Burokauskas, Dr. Kazimiras Lukauskas, technologists Dr. Genricas Dudenas, Dr. Algis Podzhunas and Ionas Makauskas.

The research was made possible thanks to the great organizer of science – the director of the Ukraine Research Center of Gastroenterology, Professor Dr. Pavel Krishen. In the preparation to publish this book, I was assisted by the translator Vitaliy Zaika, by editors Paul Glasser, Yakov Polyakov, as well as by Grigoriy Ratinov, Igor Iof and Vera Toper. William Begell made important remarks while preparing my manuscript for publishing. To all of them, I want to express my deepest gratitude.

The Author
New York, 2001.

Chapter 1. Food (Digestion) and Fatigue.

The centuries-long human experience in both everyday life and in medical practice attest that intake of food might be followed by deviations from the normal state of a body. These deviations might differ in strength and scale of involvement with the different parts of the body, and in polymorphism of symptoms.

As Hippocrates wrote in his *Selected writings on ancient medicine*: "Every physician should know what is human with respect to food and drink". The role of food can be clearly seen in Salerno Codex of Health. "Salty, spicy and bitter warms us up and strengthens, tart together with hard and sour bring coolness; soft with fat and sweet give tranquility" (1). Indian sources (Pandhi-Shaha) point out that "When nutrition is clear, all the body becomes clean, and when it is clean, the brain strengthens, and when the brain is strong, all the chains will be torn".

The theoretical basis of dietetic yoga is "prana-ness" of food, on which the normal functioning of body, psyche, resistance towards diseases and longevity depends. Prana, according to Yoga, is a certain form of energy, which occupies the entire universe and serves as a link between live and non-live nature and among all living organisms.

Avicenna wrote on the nutrition regimen that "food, which has dilute quality, ignites the blood, and food which condenses makes an organism mucous and heavy" (2).

From this opinion by Avicenna about negative, unfavorable influence of food on the organism one can see that he clearly connected the state of the organism with the character of food that it consumed. A state that was called "stomach melancholy" was believed to be a reason for many disorders. Avicenna considered those disorders to be a result of "influence of the stomach on the function of other organs, and especially brain."

All said above proves that by accurate scrupulous observations, our remote ancestors determined the role of food and digestion in a human's health, his activeness and passive-

ness, and emerging of illnesses. It was clearly stated that there was on one side a weakening asthenic role of food and on the other side a relation of digestion to the central nerve system. It was also mentioned that various products have different properties from the point of view of effects on activating and relaxing of an organism.

In modern times, we find description of bad feeling syndrome after intake of food by clinicists who observed patients with various pathologies, and in particular with diseases of digestive organs.

More than 100 years ago in the article "On the Relation of Neurotic Disorders to Diseases of Digestion and on Neurotic dyspepsia," Professor J. Glaks wrote (3): "The majority of patients, after taking food, have so-called "digestive fever" - the face becomes red and a bit swollen, the hands and feet become cold, the head is a bit heavy, patients become sleepy and fall into deep sleep." Then Glaks writes: "At the same time the nervousness and irritation grow stronger, the heart beats harder and pulse alters; the pulsing of the stomach aorta can be felt and patient can feel the sound of his heart, especially in horizontal position. This is accompanied by shortness of breath, headache and even 'heart stress.' The reason for this is food". Glaks quotes the specialized literature, where there is a description of a disease with unclear symptoms, called "atonic digestion weakness." Even in that name there is a clear link of digestion to emerging weakness and pathological disorders.

Glaks writes that he observed patients who after taking food had "fatigue and drowsiness," and who used to take food at night in order to get rid of insomnia. He considers that "this syndrome is connected to the incitement of stomach nerves and its cause is a meal."

"Once such a condition appears, patients are afraid to have any food and try to limit their meals drastically."

O. Rosenbach calls such a condition "neurosis of wandering nerve": after shortcomings in the diet, the attacks of "stomach stress" appear, where the digestive disorders give way to neurotic phenomena. Such attacks are characterized

by shortness of breath, strong heartbeat and arrhythmia, pulsations in the stomach aorta area, suppressed mood, feeling of hunger which become extreme, unpleasant feeling in the area over the kidneys, and constipation. Such phenomena after meals might occur in totally healthy people.

More than 100 years ago, W. Leibe introduced the term "nervous dyspepsia", when he described a characteristic picture of such condition after meals among a number of people: "It is known that in the majority of healthy people, stomach and intestinal digestion has no noticeable impact on their general condition. As a result of plentiful, abundant meals some people feel slight indisposition: fullness in the epigastric area, influx of blood to the head, excitement, lack of working ability, heaviness in feet, drowsiness" (4).

Excessive irritation of stomach nerves during digestion makes not just one symptom, but a cluster in the picture of a disease, which might be called "nervous dyspepsia."

Thus Leibe considered the pathological state of an organism to be a result of having food, a separate disease. Nervous phenomena are linked to digestion and according to Leibe, the main determining syndrome is "physical and mental depression." He also considered that "nervous dyspepsia" might be a background of the emergence of a number of diseases. One should mention that the connection of the digestive system to the general condition of an organism and its behavior attracted the attention of scholars in the last century like Kraft Elbing (5).

A prominent German clinician of the early twentieth century, A. Strumpel in his work "A Handbook of Particular Pathology and Therapy of Inner Diseases" (7), chapter on stomach diseases, discerned a separate disease called "stomach neurasthenia (Neurasthenia gastrica s. dyspeptica)." He wrote that "diseases of the digestive tract might even cause psychosis, which then has the character of melancholia with a hypochondriac shade." Beard (6) called this syndrome in 1881 "asthenic dyspepsia" and considered it to be a signal of "decreasing bodily strength."

He wrote: "Patients of this type claim that after every meal, they feel pressure and pain in the stomach, and it was enough for them to have some food for the stomach to become overfull and bloated. Because of this, there appears a feeling of constraint in the chest and a strong heartbeat." And further: "Very often, along with the stomach symptoms there are other nervous phenomena, signs of increased psychic excitement, and symptoms like headache, heaviness in the head, dizziness, abnormal feelings in the extremities (pain, cold, anemia). Then sometimes comes complete nervous anorexia, fear of eating and even disgust toward food. Obviously, the result of such a condition might be quite significant, sometimes strong migraine, weakness and adynamia" (8).

Thus even these observations of our distant and closer predecessors gave them ability to determine, describe and investigate as a separate nosological unit the symptomatic complex of pathological reactions upon having food.

At first glance, it seems incredible that these two concepts, general weakness and food, might be related to each other. But it is so.

What else can prove such a possibility? If one considers that food intake, digestion, weakens and exhausts an individual, with all other unfavorable results, then limits on food might help to decrease or eliminate this asthenic effect.

Analysis of available data about the impact of hunger or limits in food intake on an individual's activity completely proves the weakening effect of digestion on the individual, which has been observed in many patients. Let us look at experimental data in this sphere. Most interesting were experiments by Bezredka at the Pasteur Institute at the turn of the century (9). In his book, he quotes the results of surveys on the weakening of the reaction to the lethal dose of horse serum in anaphylactic porpoises: "The animals sensitized with the help of horse serum and without food for 36 hours were capable of withstanding a second injection of a lethal dose of serum. They had only dyspnoea as the sole manifes-

tation of anaphylactic shock. Meanwhile, the same dose of serum killed sensitized animals that had been fed normally.“

Thus this clear experiment showed that hunger eliminated the lethality of the anaphylactic effect of horse serum. Nutrition "furnishes" that lethal effect. Food decreased resistance of the individual to the occurrence of such dramatic reactions as anaphylactic shock. Similar data were obtained in our time by experiments in space medicine.

Hunger drastically increased survival and assisted the stability of an individual in the face of harmful and lethal agents. W.S. Myles studied the survival rate of hungry rats that fasted 24, 48, 72 and 96 hours, and non-fasting rats that were taken to a height of 10,200 meters.

All non-fasting rats died in less than 2.5 hours, and average survival time was 27.3 minutes. Twenty-four hours of fasting hardly altered mortality — 96%, but for the rats that fasted 48, 72, and 96 hours, the mortality rate was respectively 67%, 21% and 17% (10).

Rats that fasted 48 to 72 hours had a prolonged time of survival in an altitude chamber at pressure equivalent to an altitude of 9,756-10,365 meters and a temperature of 32 degrees centigrade. Survival time in minutes in the control group was 12, 31, 45; after 24 hours of fasting — 25.6 ± 9.0 ; after 48 hours — 70.9 ± 6.5 ; after 72 hours — 64.5 ± 12.2 .

Hence, food intake exhausts an individual. If this is so, then fasting might increase the resistance of an individual to diseases, improve health and prolong lifespan.

This is attested by experimental work carried out in the middle of the twentieth century. In the works of McCay (11), published in 1941-43 and devoted to the problem of aging and longevity, the author clearly showed that the lifespan of rats might be significantly prolonged by sharp limiting access to food. Robertson, Mirtson and Volter showed that fasting male rats lived 745 days, whereas control male rats lived only 712, and fasting female rats lived 819 days, whereas control female rats only 773 days.

In their work, John Carlson and Fred Cheltzel of the University of Chicago came to the conclusion that a rat's

lifespan increased with periodical fasting. The optimal period of fasting is once in three days, and such a regimen increased the lifespan of male rats by 20% and female rats by 18% (12).

It was also proved that the rats moved actively, and food intake reduced the animals' activity.

Very interesting experiments were carried out by Tannenbaum (13). In experiments on animals, he proved that limiting food consumption without changes in the proportion of its components might halve the frequency of occurrence of spontaneous tumors of the mammary gland and lungs and of cancer of various organs caused by known carcinogens. When underfed, the mice grew half as large as mice that had plenty of food, but they were more active, healthier and lived longer.

Thus, these experiments on the protective effect of underfeeding were completely proved in a number of works. Non-lethal tumors on mammary glands emerged in 64% of mice that had food regularly, and only in 8% of animals that took food at long intervals. R. Doll and R. Peto consider it correct that these clear data have not (and probably will not) found practical implications, because healthy people are unlikely to limit their eating, which brings them pleasure. Nevertheless, the authors think that "we do not yet have a clear picture of how the limit on food has a preventive effect on cancer in laboratory animals" (14).

All the above attests to the fact that nutrition might assist carcinogenesis. Hence food and digestion reduce the resistance of the individual animal to the activities of harmful, pathogenic and lethal agents. That means, paradoxical as it might sound, that food and digestion weaken the individual and make him more receptive to damaging factors of the environment, both external and internal, and to occurrence of pathology.

That is why dosed fasting has become a method of fighting disease and of increasing the adaptive abilities of the individual. A simple explanation of why hunger often improves the condition of an individual was given by Professor

E. Puld of Berlin in 1930, when he noted that during World War I, when there was a lack of food, many patients with heart and kidney disorders and diabetes felt an improvement of their condition. He wrote: "Food is a load not only on the digestive organs, but on the entire organism, and it gets tired from digesting."

G.I. Babenko, V.Yu. Gurovich, and Ya.Ya. Rudakov (15) point out that thirty years of experience with alimentary fasting as a method of treatment have made possible the determination that fasting has a favorable healing and prophylactic effect on so-called adaptation diseases.

For more than eight years, the authors carried out dynamic complex research on biological changes in the human individual under the impact of dosed fasting, and an attempt was made to find out the main mechanisms of therapeutic influence on adaptation diseases.

After dosed fasting, the human ability to withstand pressure (biological: sugar, insulin, adrenaline; physical: light, noise, distractions) increased by 20% in both ill and healthy persons.

And though centuries-long experience attests that the character of human behavior is connected to food intake and digestion, and human activities, passivity, emotions, tonus, sleep, mood can also be attributed to them, we have always looked at food in quite a limited way. This can be illustrated by the words of Nobel Prize winner Rene Dubos. He wrote that the relation between food and human existence contains factors that by far outweigh the mere relation between biochemical nutrition and physical life. The relation between food and behavior was hardly taken into consideration. Dubos wrote, "It is very difficult to establish by some positive persuasive means the causal relation between a given type of reaction and a given component of nutrition" (16).

F.I. Komarov et al. present a review of their data on the character of the impact of nutrition on the human condition. The authors write: "Life experience shows that the character of food consumed at dinner has its influence on the dynamics of sleep. But meanwhile, solving a number of practical ques-

tions on the rational composition of a dinner remains purely empirical to date" (17). "It is characteristic that the more effort needed to digest food in the digestive tract, the more the brain's excitability is reduced after food intake. We find no other explanation when the same caloric quantity of meat fat causes a more obvious reduction in brain excitability than sausage, and among dairy products cream and cottage cheese more than natural milk" (18). The authors have shown that 10-15 minutes after food intake, brain excitability drops, and this lasts for 1-1.5 hours. That is why, in their opinion, humans and animals have a noticeable tendency to sleep and tranquility after meals, and it also depends on the quality of the contents of the food.

For a certain category of people, food is a sort of tranquilizing substance, which gives psychic balance in the face of trouble (19).

And what does this clinical event known as "dumping syndrome" represent in reality? Let us analyze the history of this question.

Notwithstanding the extreme importance of this problem, digestion and fatigue, which has been of interest to scholars for several centuries, one should note that perhaps because of its seeming simplicity, it has not received due attention and research. The whole problem of the worsening of this condition after food intake (if obvious facts are not ignored, which is not uncommon in medicine) following stomach surgery (after operations to replace parts of the stomach or the whole stomach), confirmed, as a good experiment should, that the character of the individual's reaction was caused by food when it appeared in the digestive tract and to a significant extent depended on the function of the stomach and duodenum. That specific clinical syndrome, which in various times was called "early post-food syndrome," "late post-food syndrome," "abdominal discomfort," "agastral asthenia," has recently received the name "dumping syndrome."

This term, which is used nowadays, was proposed in 1922, as it was believed that the essence of this pathology

was in the very fast emptying of the stomach and the quick supplying of food to the small intestine. Since then, 25 theories of its emergence have been proposed. And although according to many authors, the main factor in this pathology is asthenic syndrome, its provenience is still undetermined.

In our clinic, S.Ya. Kornilova compared the character of complaints before and after the resection of the stomach on dumping-syndrome patients.

Table 1
Disorders appearing after resection of stomach

Complaints before resection	Complaints after resection
1. Pains before meals and at nights in epigastrium	1. Weakness after meals
2. Constipations	2. Need to lie down after meals
3. Pre-meal pains in right sub-rib area	3. Intolerance of sweets and milk
4. Heartburn	4. Heartbeat after meals
5. Nausea	5. Pains in right sub-rib area
6. Vomiting	6. Pains in epigastrium
7. Bleeding	7. Sweating after meals
8. Pre-meal pains in left sub-rib area	8. Pains in left sub-rib area
9. Belt pains	9. Nausea
10. Bitterness in mouth	10. Unstable stool
11. Diarrhea	11. Dizziness after meals
	12. Sleepiness
	13. Bitter
	14. Diarrhea
	15. Vomiting after meals

Thus, the main complaint among resection patients during food intake was asthenia (general weakness, need to lie down). This research, carried out in our clinic, completely coincides with the data of other researchers. This can be proved by enormous literature devoted to the "dumping syn-

drome" (V.Kh. Vasilenko, P.A. Korzhukova, N.O. Nikolaeva, V. N. Ponomarenko et al. (20). "Specific features of the dumping syndrome," write L.V. Poluektov, A.I. Dobrovolsky and V.P. Sienko, "are attacks of physical impotence and pains after meals" (21).

According to V.Kh. Vasilenko et al., the most frequent disorders caused by food are weakness, sweating, ardor, heartbeat, dizziness, fever, pains in epigastrium, headache, heartache, darkening in eyes, fainting, vomiting.

"In our opinion," write V. Kh. Vasilenko et al., "psychological and neuro-vegetative disorders are intrinsic components of postgastroresection derangements (20). They are a manifestation of asthenisation of the psychological and somatic sphere of a patient and substantially increase the burden of pathological processes in the digestive organs."

According to V.Kh. Vasilenko et al., the following are the most common disorders that occur after meals in the dumping syndrome patients.

Table 2
Symptoms Occurring After Meals in Dumping Syndrome Patients
(according to V. Kh. Vasilenko)

Symptoms	Percent of cases
Weakness	100
Sweating	95
Ardor	85
Heartbeat	69
Dizziness	67
Fever	59
Epigastralgia	40
Nausea	39
Headache	34
Darkening in eyes	27
Pain in heart area	24
Fainting and pre-fainting condition	13
Vomiting	12
Bitter belch	9
Ant feeling	6
Trembling in epigastrium	6

Thus, the most common disturbances caused by food in so-called dumping syndrome are weakness, sweating, heat, palpitations, dizziness, body trembling, epigastralgia, headache, pain in heart area, nausea, darkening in eyes, syncope and faint condition, vomiting. This is reflected in the data presented in Table 2.

All the authors note weakness, asthenia as a dominant symptom.

A great deal of research on the study of dumping syndrome was done over many years in our clinic by L.Ya. Melnichenko (22).

The clearest picture of dumping syndrome was caused by intake of dairy products in 198 (73%) patients, sweet food — in 192 (70.9%) patients. After meals, especially sweets or dairy, there appeared increased weakness among 92.6% of patients, sweating — 74.9%, palpitations — 63.8%, dizziness — 44.6%, necessity to lie down because of feeling bad — 37.6%, fever heat — 27.7%, headache — 26.6% of observed patients. Less frequent were complaints on body trembling (16.6%), rigor (10.7%), cramp (2.2%).

Of dyspeptic phenomena, the patients most frequently mentioned nausea (49.8%), bitterness in mouth (29.8%), vomiting (14.4%). Stomach functioning disorders were observed among 81.1% of patients, of whom 42.4% had diarrhea, 18.5% — constipation, 20.3% — unstable stool.

Very often complaint among observed patients was pain. It was localized in the epigastric area among 72% of patients, in the left hypochondrium — among 56.1% of patients. Pain as a rule had a dull, constant nature, and some patients (12.1%) felt increase of pain to attack-like pain.

Thus, in observed patients with post-gastroresectional syndrome, in the first place in the clinical picture of the disease was asthenic syndrome, followed by dyspeptic and pain syndromes. The food intake is accompanied by tachycardia, a rise in blood pressure, and a high concentration of serotonin and histamine in the blood.

The vast majority of patients had achlorhydria (88.3%), biliary deficiency (63.4%), decrease in hydrocarbon and ferment extracting function of pancreas (94.5% of patients).

All the above attests to the involvement in dumping syndrome of many organs and systems into the pathological process.

Table 3. Changes in organs and systems after stomach resection in dumping syndrome
(According to the literature)

Authors	Changes in organs and systems
N.B. Karaman, 1960	Changes in external secretory function of pancreas, decrease in activity of pancreatic enzymes. Most drastic decrease is in trypsin and lipase. Diastase increases in urine and blood. Incretory function of pancreas is disturbed, which results in alimentary hypoglycemia. Pigmentic and albuminogenic functions of liver are disturbed.
A.G. Nadzharov, I.T. Abasov, 1972	In distant terms after stomach resection in case of cancer suppression of the main functions of pancreas is frequently observed. Incretory function is disturbed more frequently than excretory.
M.S. Turkeltaub, S.S. Dolgats, V.E. Vitsak, 1971.	Suppression of external secretory function of pancreas. Disturbances have a character of "dyspancreatism, with preferential decrease in lipase".
T.I. Loranskaya, I.S. Volkova, 1970	Activeness of trypsin and lipase in blood had a tendency towards increase. Trypsin in gastric juice is within normal rate, lipase increased.
N.M. Sputelsky, 1968	Deficiency of liver and pancreas. Albuminogenic and carbohydrate function of liver affected most, as well as lipolytic function of pancreas.
N.N. Kuznetsov, 1968	Suppressed function of pancreas.
B.R. Reketinsky, B.A. Garushin, 1971	After Bilroth-1 operation, the enzyme activity of pancreas is somewhat higher than at Bilroth-II, and at Bilroth-II the quantity of juice is decreased. Decrease in albumins, increase in globulins, decrease of albumin ratio observed.
S.P. Markin, Yu.V. Ognev, 1967	Quick increase in juice secretion and its exhaustion.

There are also considerable changes in dumping syndrome observed in the neuro-psychic sphere (noted among patients with gastric diseases and described in detail by clinicians of the past even before performing operations on the stomach).

E. German and A. Prusinski consider that post-operative syndrome is revealed in dyspeptic and neurovegetal symptoms (23). They point out that the neurogenic symptoms of post-resection syndrome are characterized by general weakness, which occurs 20-25 minutes after food intake.

In this context, R. Galperina (24) notes the following psychopathological syndromes:

Asthenic syndrome: High fatigability, flaccidity, decrease in mental and physical efficiency, constant feeling of weakness, high erythrim, extreme irritability. In practically all circumstances, patients looked anxious and restless.

Neurasthenic syndrome is characterized by high irritability with an inclination towards conflict, extreme excitability, and explosiveness. Patients express angry dissatisfaction with the results of treatment, quite often inimical to the doctor and hostile to the public. They openly express doubt in the doctor's professional knowledge, complain about "heartless treatment" by the staff, demand "most up-to-date" means of treatment; being intractable, they imitate somatic disorders.

Hysterical symptomatic complex is characterized by the vividness and variety of clinical manifestations with an inclination to tempestuous fits, hysterical stigmas, demonstrativeness of behavior. Their behavior is affected and theatrical. Patients describe their sufferings in detail, express dissatisfaction with "inattentive" people, stress their ability to tolerate pain with bravado and at the same time try to accent difficulty of their condition and elicit compassion and pity among the public.

Depressive syndrome is characterized by anguish, depressed mood, insomnia, obsessive thoughts about hopeless state of their health, disbelief in the correctness of the diag-

nosis, appearance of suicidal thoughts and tendencies, temporary visual and aural hallucinations.

All these neuropsychic disorders are determined by some new condition of the digestive tract, which emerged after the operation. It seems that dumping syndrome might be an additional clinical proof of the role of the digestive system in the psychovegetative status of a person.

Why does this multisymptomatic syndrome occur? It seems that because this symptomatic complex emerges after stomach resection (many patients stress that "there was nothing similar to it before the stomach operation"), it is natural to suggest that the asthenic syndrome is a result of the disappearance of certain factors (with the removal of part of the stomach and the duodenum being rendered passive) which prevented that "pathological manifestation of food action" before resection. This pathological condition was called "agastral asthenia" and with good reason (25). According to its authors, this term reflects, "the main pathogenic factor and most characteristic clinical features of the disease."

Among the majority of patients, the feeling of weakness turns into a complete loss of energy and causes a patient to stop working and moving and to lie in bed. After the attack of weakness comes monotonous flaccidity and quick fatigability.

According to the findings of all the authors, including us, there are more and less asthenic products.

Table 4
Main food items which cause dumping syndrome
(based on literary data)

Authors	Item
1. T.I. Loranskaya, G.D. Nikiforova, 1972	Carbohydrates – 100% Mixed breakfast – 3/4 Protein breakfast – 2/3
2. S.P. Markin, Yu.V. Ognev, 1967	Hypertonic solutions of glucose, milk, fat – sepa- rate or combined with each other
3. L.G. Zavgorodny, V.V. Sychova, 1976	Sweets, dairy products
4. A.F. Bashmakov, 1969	Carbohydrate food (sweet and diary) mixed food, usual food
5. Yu.M.Pantsyrev, 1973	Sweets, dairy products
6. M.I. Kuzin, M.A. Chistova, L.V. Chistov, 1976	Any food, sweet and dairy dishes
7. G.D. Viliamin, G.A. Bulgakova	Sweets, diary prod ucts.
8. L.V. Poluektov, 1973	Dairy products and food combinations with large contents of re- fined carbohydrates and fat

T.E. Machella (26) and also A. Borgstrom (27) did not observe any substantial difference between persons who had undergone an operation and those who had not with respect to the reaction of discharge of glucose into the small intestine.

As A.V. Frolkis pointed out in 1971, in complicated cases of enteritis, food intake sometimes causes malaise, accompanied by complaints that recall dumping syndrome. In such cases, soon after a meal patients were observed having general weakness, need to lie down, sudden fever or chill,

influx of blood to the head, sweating, palpitations, dizziness etc (28).

In our clinic, N.M. Bereza did research on patients who had cholecystectomy. For many of them, she found a similarity in their clinical picture with a pathological symptomatic complex after stomach resection (29).

Under study were 15 patients of both sexes aged 35 to 45, with disease duration from 5 to 24 years. Along with complaints of dyspeptic disorders and abdominal pain localized mostly in the area of both the hypochondria and epigastria, there were also complaints of malaise (attacks of general weakness after food intake, especially dairy, sweets, warm liquid dishes). Attacks occurred immediately after meals (after 5-30 minutes) and lasted 45-90 minutes, accompanied by dizziness, headache, heaviness in the head, palpitations, sleepiness, need to lie down, tremors of the body and extremities, heaviness in the extremities, squeezing pains in the heart area, darkening in eyes, intoxication, chills and other symptoms of general discomfort.

The author concludes that post-alimentary asthenia might occur not only after stomach resection, but also after cholecystectomy.

In our clinic, N.M. Bereza and T.I. Mameyeva carried out a survey research on tolerability of certain food items among 224 patients with diseases of the digestive organs, of whom 175 had pancreobiliar pathology, 23 — chronic gastritis, 12 — peptic ulcer of stomach and duodenum, 14 — chronic enterocolitis.

The survey included the following types of food: hot spicy foods, fried foods, sour foods, protein dishes (meat, fish, eggs), easily consumed carbohydrates (sugar, honey, jam), dairy dishes (fresh milk, sour milk products, cottage cheese), vegetables, fruits.

Of 224 patients, only 20 had no disorders, and the remaining 204 patients (91%) connected their discomfort directly to food intake: weakness, sleepiness, palpitations, sweating, tremor of the body and extremities, fever, dizziness, headache etc, and also dyspeptic and pain syndrome.

This was noted by all patients with chronic enterocolitis, 95% of patients with pancreobiliar pathology, 68.5% of patients with chronic gastritis and peptic ulcer.

Among observed changes the most common was a combination of general phenomena, dyspeptic disorders and pain syndrome in the abdomen with various localization.

In the first place among food products that could not be tolerated was fresh milk (33.8%), second — hot, spicy dishes (30.8%), third — fried dishes (29.9%), fourth — any food (including dietetic products) — 27.9%, carbohydrate and fat dishes — 20.5%, sour dishes — 19.6%, vegetables — 18.6%, fruit — 14.7%, eggs — 13.2%.

The research allows us to draw the conclusion that so-called dumping syndrome reaction is not specific only to patients after stomach resection, and it is well correlated with the data of many other authors.

On this basis one might conclude that food intake (digestion) is in many cases accompanied by a pronounced clinical syndrome, whose main manifestation is discomfort, general weakness, feeling of brokenness and fatigue.

Thus one can come to basic conclusions that evaluate the general character of the influence of food on an individual. Both in experiments and among healthy people and patients with intact digestive tract and patients with postgastroresectional dumping syndrome, there is a similar clinical picture which can be called variously: neural dyspepsia, neurological dyspepsia, asthenic dyspepsia, digestive fever, post-meal malaise syndrome, dumping syndrome, agastral asthenia, early post-nutritional syndrome, late post-nutritional syndrome. For all these nosological definitions, there is one characteristic that is the connection between food, digestion and asthenic syndrome.

We realized the hitherto unknown nature of this asthenic syndrome (as it sometimes happens) while studying the role of digestive hormones in the genesis and treatment of diseases of digestive system.

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