THE EFFICACY OF THE HERBAL IODINE SOLUTION CONCENTRATE FROM THE BRAND OF "JADRANKINA OTOPINA" (JADRANKA'S SOLUTION) IN THE TREATMENT OF THYROID DISEASES

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Abstract: This paper presents the results of the research on effectiveness of the Herbal Iodine Solution Concentrate "Jadranka's Solution" on diseases of thyroid gland. The research included 64 participants who fulfilled detailed online questionnaire about their socio-demographic data and experiences they had with the Herbal Iodine Solution Concentrate „Jadranka's Solution". Along with that, each participant sent us two laboratory findings of the blood' level of TSH and T4. The most important result of the research was confirmation of the hypothesis that regular use of the Herbal Iodine Solution Concentrate "Jadranka's Solution" improves clinical status of patients with disorders of thyroid gland. Pairwise' comparison has confirmed significant difference at the ,05 level for levels of TSH and T4 before and after the use of "Jadranka Solution". Statistically, the results of the study showed a significant decrease of the values of TSH, and an increase in FT3 and FT4 hormones to their mid-values and above the reference value, when comparing values at the point of diagnosed health issues.
These results confirms subjective evaluation of the participants who, in 98.5% of participants evaluated effectiveness of Herbal Iodine Solution Concentrate "Jadranka's Solution" as excellent and none of them evaluated Solution as ineffective. Speaking about socio-demographic data, most of the participants were 30 to 40 years old (56%), 49,2% of them have university' degree and 68.6% of them is employed. These data point that participants are better educated and informed than overage population in Croatia. Most of them use Herbal Iodine Solution Concentrate "Jadranka's Solution" because of diseases of thyroid gland, 73.4% because of hypothyroidism and 7.8% because of hyperthyroidism.

Introduction

Iodine is a trace element that is essential to the organism in small quantities. Adequate intake of iodine is irreplaceable in the synthesis of thyroid hormone, thyroxine (T4) and tri-iodothyronine (T3) necessary for growth, organ development and the use of nutrients in the body (1). Serious iodine deficiency increases the risk of various disorders in children and adolescents, but the most pronounced development of hypothyroidism and dyspnoea. Namely, thyroid hormones regulate various physiological processes such as protein synthesis, growth and development (2). The chronic iodine deficiency results in increased TSH synthesis in the pituitary gland that stimulates the thyroid to increase the use of available iodine, which over time leads to thyroid hypertrophy and the formation of one or more nodules on the thyroid, ultimately resulting in drowsiness. Health risks arise not only in severe iodine deficiency, but also in small or moderate iodine deficiency, resulting in decreased work capacity, metabolic disorders, disturbed thyroid function, and dyspnoea. In children, slower growth and decreased cognitive functioning resulted in reduced IQ.

In 1993, the World Health Organization therefore issued a decision on the obligatory iodination of kitchen salt, as it is a safe and inexpensive way to combat the lack of iodine. It seemed that this procedure would ensure optimal iodine intake for the entire world population. However, despite these efforts, iodine deficiency has become a public health problem again in developed countries such as Australia and the United Kingdom, which were previously considered to be iodine-sensitive countries. The World Health Organization estimates that 2 billion people, including 285 million school children, have a deficit of iodine (3).

Therefore, the measure of addition of iodine to the kitchen salt proved insufficient for the ingestion of sufficient amounts of iodine, and in many studies it proved extremely useful to add additional iodine Solutions. The fact is that in cases of mild to moderate iodine deficiency, increased thyroid activity may be retained by euthyroidism, that is, thyroid hormone levels are within normal limits, but chronic thyroid stimulation leads to the formation of nodules on thyroid glands and consequent clinical illnesses. Increased intake of iodine leads to a decrease in the incidence of subclinical hypothyroidism and to a reduction in risk for M. Graves (Graves' disease) and thyroid

carcinoma. Accordingly, iodine optimization is an important component of preventive health programs aimed at reducing the incidence of thyroid disease (1,4).

Opinions on the addition of iodine are split, some experts (mostly medical doctors working in practice with patients) insist that each patient with thyroid disease must take iodine supplements, some recommend only iodine from herbal remedies such as algae or seaweeds (4).

„Jadranka's Solution“ is precisely such a solution, i.e. the Herbal Iodine Solution Concentrate that contains exclusively iodine from seaweed, and is therefore completely natural. Jadranka's Solution has been on the market for two years, but the production has increased significantly in the last year and the product has a significant rise in the number of beneficiaries. This is exactly what triggered this research, the subjective sense of improvement and the feedback received from beneficiaries were extremely positive. Many stated that their subjective sense of improvement was accompanied by an objective improvement in laboratory findings (before and after the use of the Herbal Iodine Solution Concentrate), in particular TSH and FT4.

It was on this track that we designed a study with a starting hypothesis that the use of Herbal Iodine Solution Concentrate Jadranka's Solution leads to the normalization of the levels of TSH and FT4 in the blood.

Participants and methods

The study included 64 participants who used the Herbal Iodine Solution Concentrate **„**Jadranka's Solution“for a relatively long period of time. Participants were asked for consent to participate in the research and after that they had to fill out an on-line questionnaire containing general data (such as gender, age, educational level, employment) and allegations of Jadranka's Solution (reason of taking, physical illness and diagnosis, length and the daily dose of Jadranka's Solution and satisfaction with the efficiency of the Solution). Additionally, subjects were required to send scanned laboratory findings of TSH and T4 before and after use of the Herbal Iodine Solution Concentrate **„**Jadranka's Solution“ and the finding of a physician with a daily dose of Eutirox.

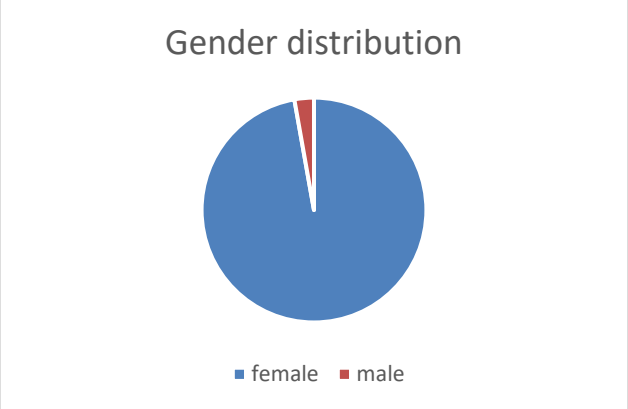
The results were processed first by a simple method of dividing the individual responses to the questions asked, and then the differences of the groups of subjects by different variants were tested with a one-way ANOVA test in order to simplify testing of the difference in TSH and T4 levels before and after the application of the tested agent. For the difference test before and after Repeated Measures ANOVA test was used. Nonparametric Spearman's rank between all variables and changes in the findings was also made. Changes to the findings are counted as a percentage change in relation to the starting value. Everything was analysed in the IBM SPSS Statistics 22.

Results and Discussion

The first group of results refers to general data on respondents and data on the illnesses they suffer from, the dose and duration of taking the Herbal Iodine Solution Concentrate „Jadranka's Solution“ and, as a matter of priority, subjective data on the effect of the Solution and its efficacy.

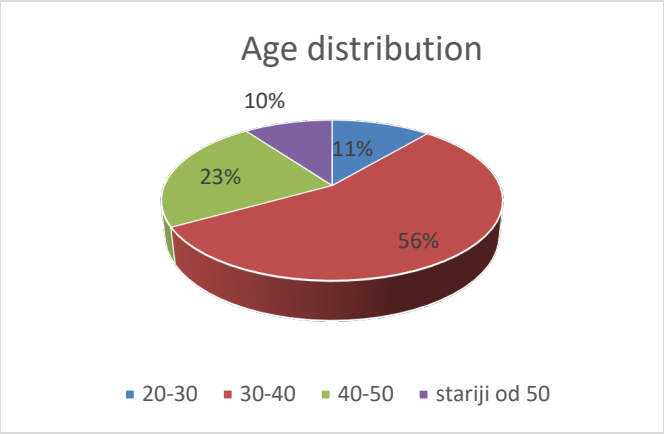
Socio-demographic data

1. Gender Distribution



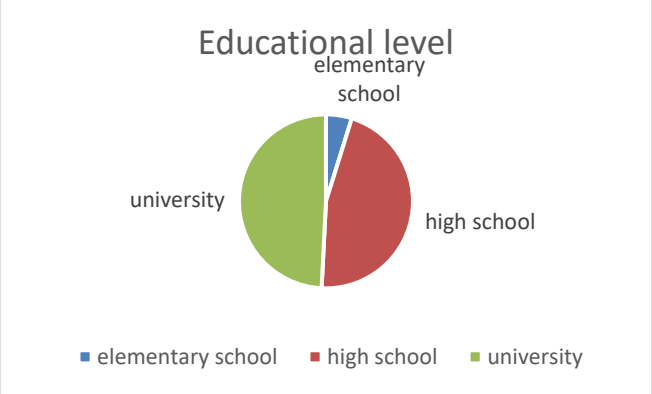
The study involved 96.8% of female respondents and only 3.2% of male respondents which was expected since the occurrence of hypothyroidism is significantly higher in women.

2. Age Distribution



The majority of respondents are aged 30 to 40 (56%), followed by persons aged between 40 and 50, while those younger than 30 and older than 50 contribute to 10%. This age distribution is expected because the disease most often occurs in people's thirties.

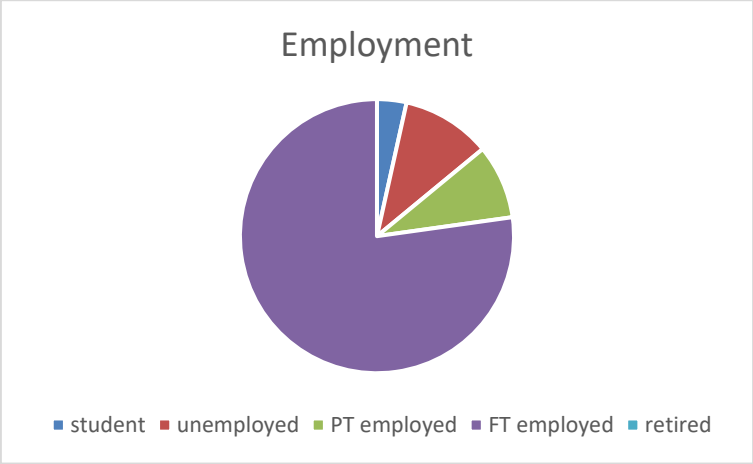
3. Education level



This distribution of educational level is interesting because it differs considerably from the general situation in the Republic of Croatia - as opposed to the general share of highly educated persons in the population of 17.8%, in our sample 49.2% are highly educated persons.

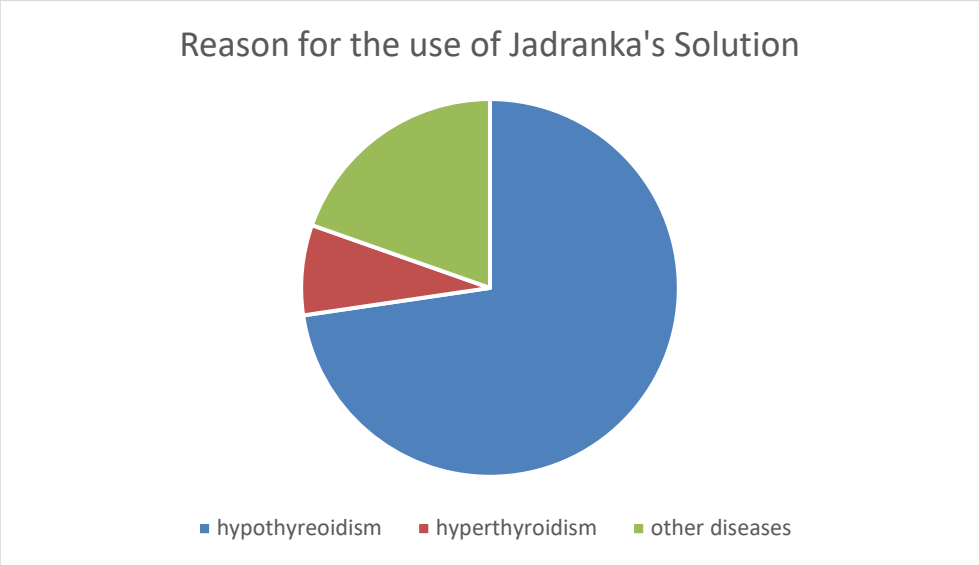
The explanation of this result lies in the fact that highly educated people have more interest in their own health, they try to be informed about the possibilities of treatment and, in particular, are more open to using non-pharmaceutical Solutions. Indeed, information on the long-term effectiveness of the replacement therapy is twofold, and the evidence of the importance of iodine in improving the thyroid function is unquestionable, and it is assumed that more educated persons use more sources of information, in particular they are more literate and use information in the right way.

4. Employment status



These results are very interesting, 68.8% of respondents are employed, which is more than the Croatian average, that mostly comes as high as 50%, but this is explained by the age distribution and educational level (the largest number of respondents is younger).

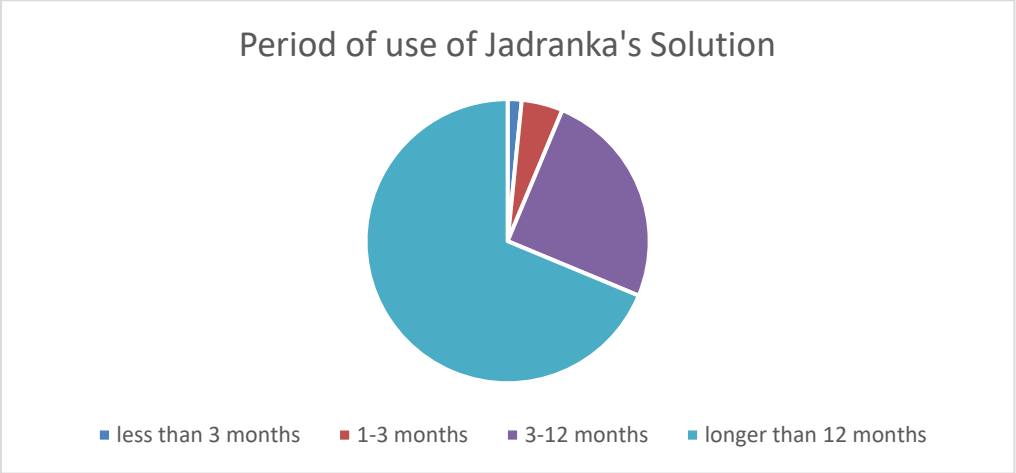
5. The reason for the use of the Jadranka's Solution



Among the participants, the largest share used the Herbal Iodine Solution Concentrate „Jadranka's Solution“for thyroid disease, far more for hypothyroidism (73.4%) and 7.8% for hyperthyroidism. The other respondents generally referred to some of the disorders of reproductive organs, most commonly cysts on the ovaries or menstrual cycle disorder.

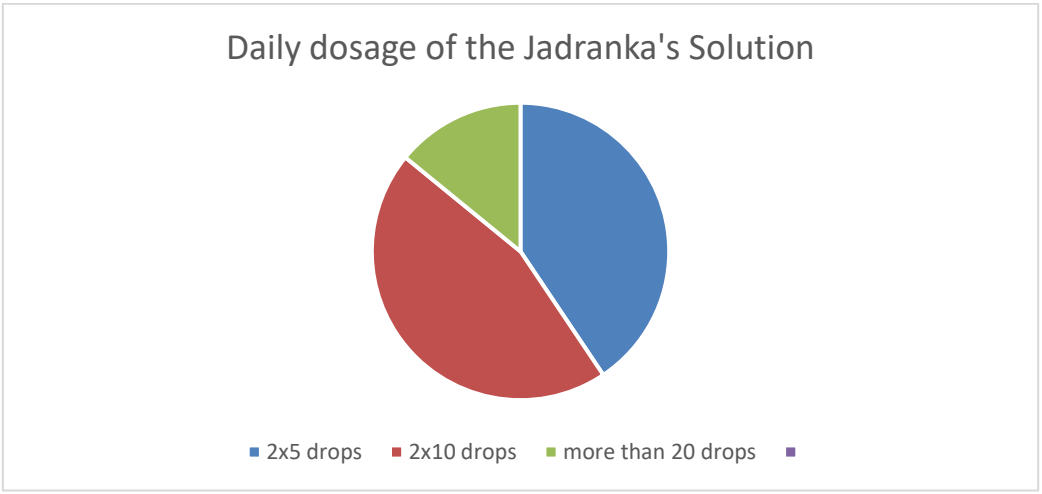
This distribution diagnosis is not a surprise because it is well-known that iodine deficiency affects the functioning of the thyroid and it is a clear need for patients to try to compensate for the deficiency, or, as they usually say, "feed thyroid with the iodine".

6. Period of use of the Jadranka's Solution



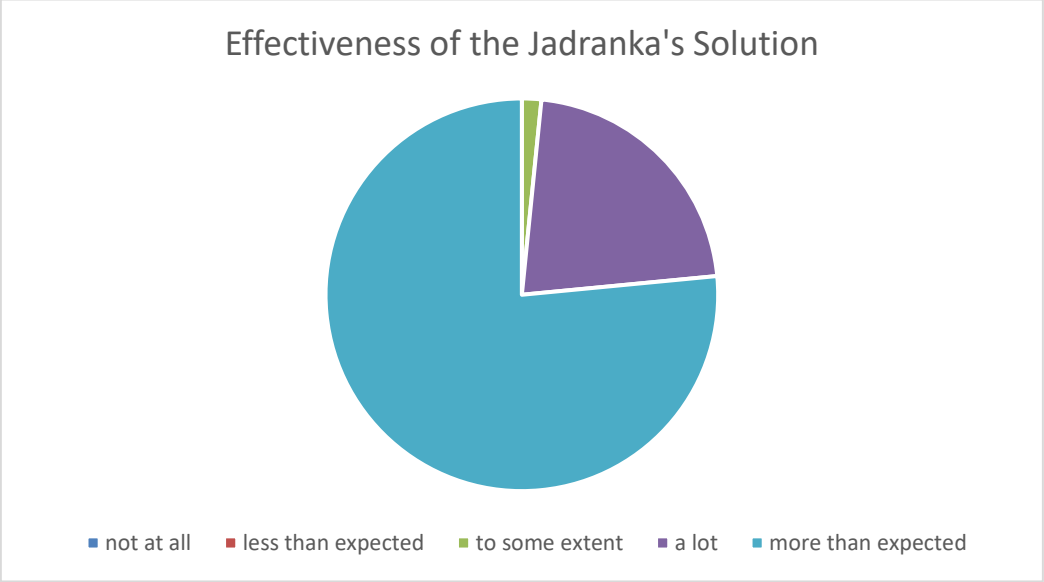
Most participants have taken the Solution for more than a year (68.8%), another 25% longer than three months, therefore, a total of 93.8% take the Solution regularly for more than three months. This information points to two facts, the first is that the subjective feeling of improvement leads to the regularity of taking the Solutions, and besides, those who take longer to take the Solution have rather taken part in the research.

7. Daily doses of the Jadranka's Solution



Similar number of participants have took 10 drops (40.6%) and 20 drops (45.3%) of Jadranka's Solution daily, divided into two doses. However, 14.1% of subjects received more than the recommended dose which potentially could cause adverse reactions. Subsequently, they were sent a message that they should not take doses larger than the recommended dose.

8. Self-evaluation of the effectiveness of the Herbal Iodine Solution Concentrate „Jadranka's Solution“



This graph shows the subjective feeling of satisfaction with the the Herbal Iodine Solution Concentrate „Jadranka's Solution“. As visible in the graph, participants were asked to evaluate satisfaction with results after taking the Herbal Iodine Solution Concentrate. Five responses were offered, on a scale from 1 to 5, where 1 indicates complete dissatisfaction with the efficacy of the Solution, while 5 indicates that the effects are better than expected. A total of 98.5% of respondents rated the efficacy of Jadranka's Solution 4 and 5, of which 76.6% estimated that Jadranka's Solution helped above expectations. Equally important is the fact that no respondent had estimated that her drops helped less than expected or not.

We have to observe these data in the light of the above-average educational level of younger subjects, therefore by definition, the least accessible people. According to this data, it is clear, even before the examination of laboratory findings, that it is difficult to attribute the placebo effect of the Jadranka's Solution.

Laboratory findings

Table 1.: Correlations of different variables of the questionnaire

			education	employment status	physical illness	length of application	dosage	satisfaction
Spearman's rho	education	Correlation Coefficient	1,000	,384**	,230	,204	,167	-,043
		Sig. (2-tailed)		,005	,104	,152	,242	,767
		N	51	51	51	51	51	51
	employment status	Correlation Coefficient	,384**	1,000	,144	,062	,081	-,193
		Sig. (2-tailed)	,005		,312	,668	,574	,175
		N	51	51	51	51	51	51
	physical illness	Correlation Coefficient	,230	,144	1,000	-,050	-,050	-,254
		Sig. (2-tailed)	,104	,312		,728	,729	,072
		N	51	51	51	51	51	51
	length of application	Correlation Coefficient	,204	,062	-,050	1,000	-,028	,319*
		Sig. (2-tailed)	,152	,668	,728		,847	,023
		N	51	51	51	51	51	51
	dosage	Correlation Coefficient	,167	,081	-,050	-,028	1,000	-,007
		Sig. (2-tailed)	,242	,574	,729	,847		,962
		N	51	51	51	51	51	51
	satisfaction	Correlation Coefficient	-,043	-,193	-,254	,319*	-,007	1,000
		Sig. (2-tailed)	,767	,175	,072	,023	,962	
		N	51	51	51	51	51	51

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The presented results, those obtained by the correlation method, show the correlation of the examined variables. Table 1 shows the correlation of the individual variables and the correlation method results in a statistically significant association between the length of time taken and satisfaction with the Herbal Iodine Solution Concentrate „Jadranka's Solution“, i.e. the satisfaction increases with the length of taking the Solution. Table 2

shows the correlation of individual variables with changes in TSH and T4 values. A statistically significant difference was obtained with the association of the disease with the values of TSH and T4.

Table 2.: The correlation of the individual variables of the questionnaire with changes of TSH and T4

			TSH change	T4 change	EUTIROX change
Spearman's rho	education	Correlation Coefficient	,045	-,131	
		Sig. (2-tailed)	,785	,484	
		N	40	31	14
	employment status	Correlation Coefficient	,014	-,086	
		Sig. (2-tailed)	,930	,646	
		N	40	31	14
	physical illness	Correlation Coefficient	,338*	0,000	
		Sig. (2-tailed)	,033	1,000	
		N	40	31	14
	length of application	Correlation Coefficient	,097	-,164	
		Sig. (2-tailed)	,553	,378	
		N	40	31	14
	dosage	Correlation Coefficient	-,054	,352	
		Sig. (2-tailed)	,743	,052	
		N	40	31	14
	satisfaction	Correlation Coefficient	-,225	-,049	
		Sig. (2-tailed)	,162	,793	
		N	40	31	14

Table 3: Pairwise Comparisons for T4

Measure: T4

(I) TIME		Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	25,152*	,870	,000	23,349	26,956
2	1	-25,152*	,870	,000	-26,956	-23,349

Based on estimated marginal means

*. The mean difference is significant at the ,05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Figure 1.

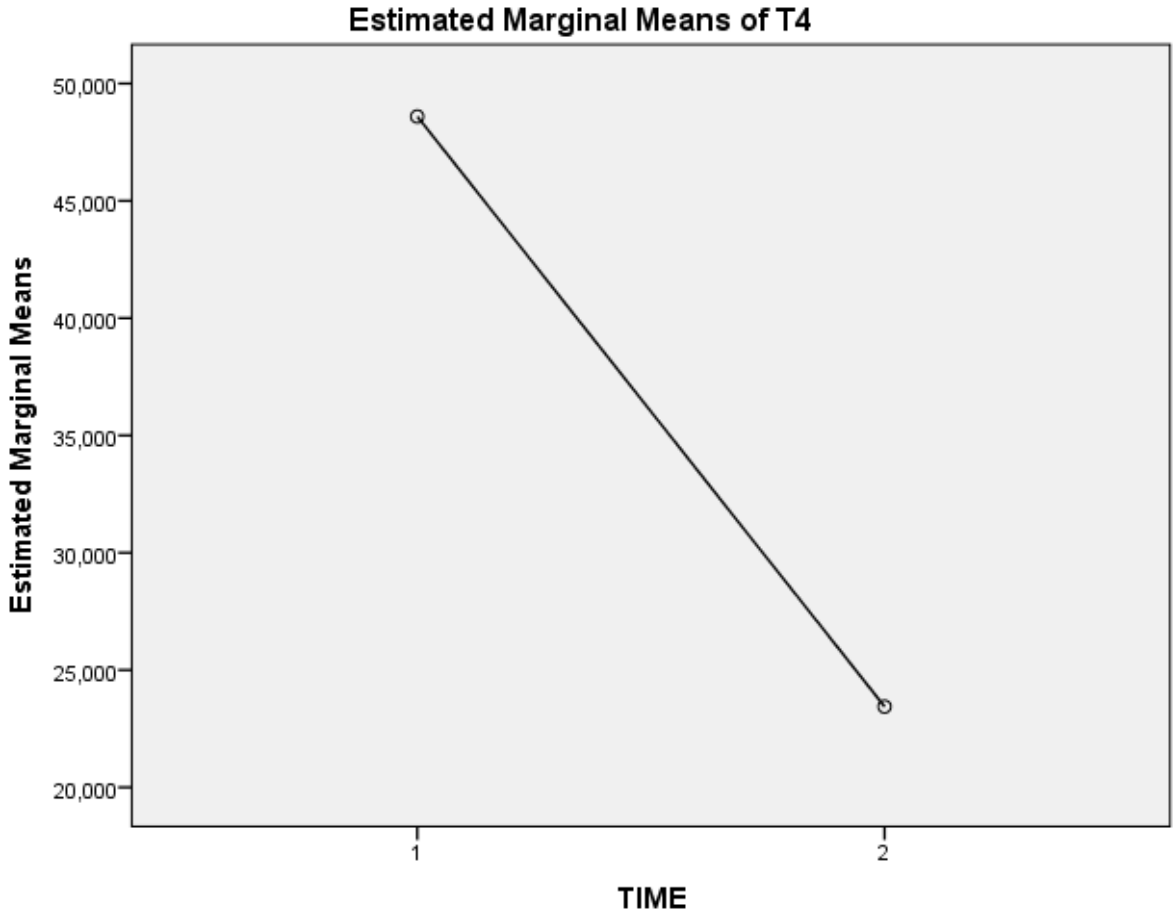


Table 4: Pairwise Comparisons for TSH

Measure: TSH

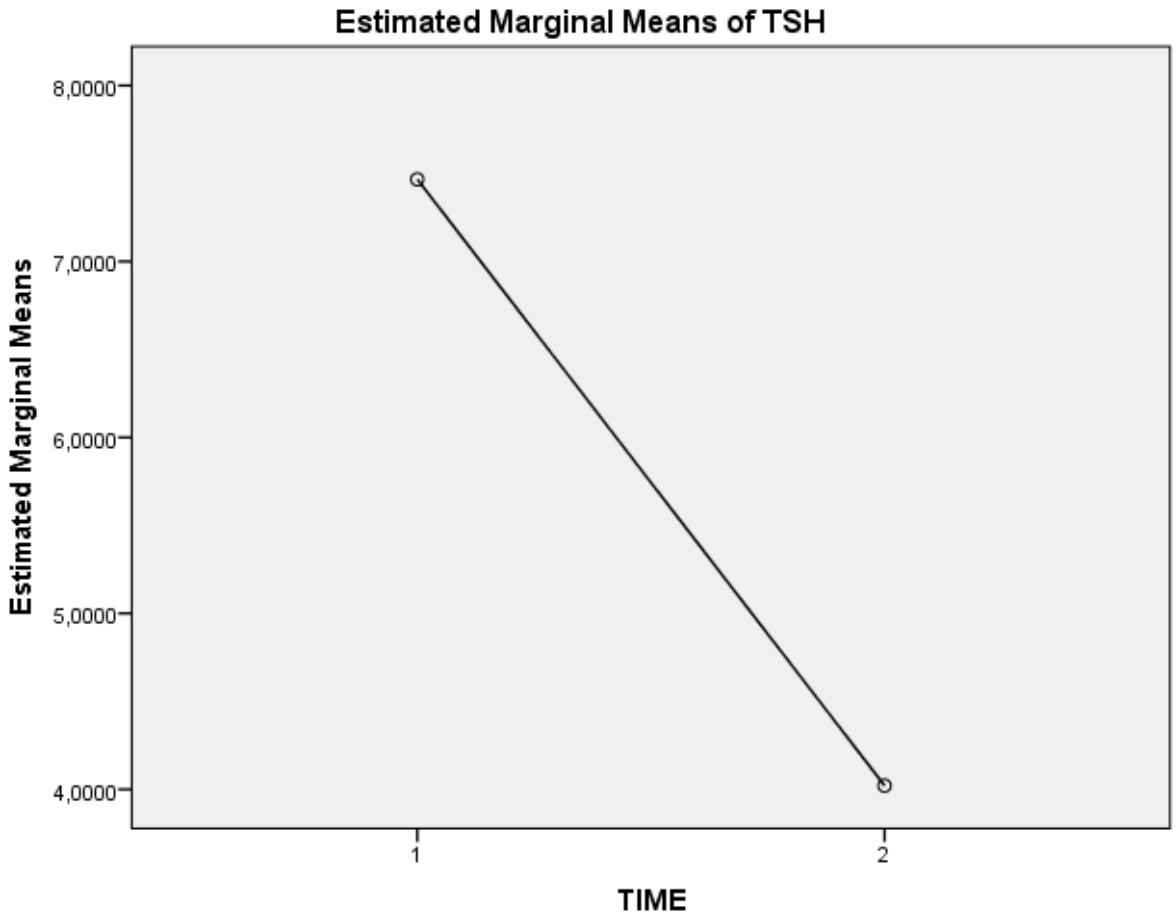
(I) TIME		Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	3,446*	,865	,000	1,691	5,202
2	1	-3,446*	,865	,000	-5,202	-1,691

Based on estimated marginal means

*. The mean difference is significant at the ,05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Figure 2.



In fact, the most important research results were obtained by Pairwise comparison and are shown in Tables 3 and 4, and in two graphs. Namely, this method confirmed the hypothesis that the use of the Jadranka's Solution results in a positive change in TSH and T4 hormone levels. That is exactly what is shown in Figures 1 and 2 - a statistically significant drop in TSH values after using Jadranka's Solution.

Conclusion

The conducted study of the efficacy of the the Herbal Iodine Solution Concentrate of the brand „Jadranka's Solution“ in the treatment of thyroid diseases confirmed the hypothesis that regular taking of the Solution results in an improvement in the health status of the respondents. The results of the study showed not only that the subjects were subjectively satisfied with the Herbal Iodine Solution Concentrate „Jadranka's Solution“ but the correlation method showed a statistically significant association between the use of the Solution and the reduction of the TSH and T4 hormone levels in the blood and consequent improvement of the clinical image (reduction or complete disappearance of the thyroid node and withdrawal of hypothyroid symptoms).

Research results are an excellent foundation for a longitudinal study that will be conducted on a larger sample, under controlled conditions and with the monitoring of a large number of parameters. It is our intention to include a greater number of people using the Herbal Iodine Solution Concentrate „Jadranka's Solution“ for other reasons, not just for thyroid disease. Besides the laboratory findings in the longitudinal study we will also observe the clinical findings of the examinees.

Finally, we think that this research was a multiple challenge. In spite of the well-known fact of the importance of iodine for the preservation of health and the impact of iodine deficiency on the development of various diseases, there is almost no research in Croatia or in the world that has studied the influence of iodine on health and diseases. An additional challenge was to deal with a solution that belongs to the so-called "alternative solutions“ because there are still many prejudices in the medical community.

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