

[Colored precipitation reaction of the urine according to Kimbarowski (FARK) as an index of the effect of ascorbic acid during treatment of viral influenza]. [Article in German]

Kimbarowski JA, Mokrow NJ.

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<https://www.mv.helsinki.fi/home/hemila>

https://www.mv.helsinki.fi/home/hemila/VitC_pneumonia.htm

<https://www.mv.helsinki.fi/home/hemila/CP.htm> (Cochrane review)

<https://www.mv.helsinki.fi/home/hemila/CP> (Cochrane review references)

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Comments:

German “grippe“ means influenza in the context.

Yellow is added by Hemilä to emphasize the relevant parts of the text.

Kimbarowski JA, Mokrow NJ (1967)

**Farbige Ausfällungsreaktion des Harns nach Kimbarowski, als Index der Wirkung von Ascorbinsäure bei Behandlung der Virusgrippe.
Deutsch Gesundheitsw 22:2413-8**

**Urine Sediment Color Reaction Test According to Kimbarowski (FARK),
as an Indication of the Efficacy of Ascorbic Acid in the Treatment of Viral
Influenza**

By J. A. KIMBAROWSKI and N. J. MOKROW, Moscow

In the domestic as well as the foreign literature one finds well-founded data in support of the concept that - in the presence of infectious diseases - typhus abdominalis, paratyphus, dysentery, scarlet fever, etc. - urine sediment color reaction in the urine represents an objective criterion for determining convalescence and a portent of a relapse or complications. The president of the Academy of Medical Sciences in the USSR emphasized the following on page 36 of his book "Principal Results of Scientific Studies in the Field of Medicine in the USSR in 1959 and 1960": "In order to recognize recovery following typhus abdominalis the results of the sedimentation reaction with AgNO_5 are necessary (advisable)."

The urine sediment color reaction test was clinically tested when it was used with a large number of patients and in various fields of medical specialty as well as when it was compared to several other tests used in the course of a disease, and in addition by means of the results of chromatographic and chemical tests. It was confirmed by these means that urine sediment color reaction has clinical and prognostic significance for many diseases, and identifies a distorted nitrogen metabolism or protein metabolism and simultaneously the degree of intoxication.

When observing the course of a number of clinical pictures it is possible in many cases to determine the true condition of a patient by means of the intensity of urine sediment color reaction in the urine and to do so more precisely than is done through the usual laboratory tests (urinstatus, diazoreaction, urochromogen reaction, clinical blood picture, blood sedimentation test, etc.).

Specialists in the field of clinical biochemistry, M. F. Mereshinski and L. S. Tscherkassowa, emphasize the following in their published work "Biochemical Processes as Protective Reactions of the Organism" (1956): "In infections and intoxications following intensified and distorted protein metabolism, insufficiency of the compensatory mechanisms occurs. Generally such insufficiency is not of any specific character and consequently its existence is not determined by any special method. Kimbarowski's urine sediment color reaction test is particularly valuable in such cases. This reaction is especially helpful in determining the overall condition of the compensatory mechanisms, and this reaction has great practical significance . . . We recommend the urine sediment color reaction test for evaluating the general condition of biochemical compensatory mechanisms."

In a published work of A. N. Judkewitsch (1952) "Clinical Significance of the Urine

Sediment Color Reaction Test According to Kimbarowski in Viral Influenza and Seasonal Colds” it is emphasized that in severe cases of the mentioned diseases the intensity of urine sediment color reaction rises. Thus, it turned out that the urine sediment color reaction test is more sensitive than the ESR [erythrocyte sedimentation reaction] and indicates the condition of the patient more precisely than do the clinical blood picture and urinalysis. Available in the literature is useful information from J. A. Kimbarowski concerning urine sediment color reaction’s reduction in intensity in the urine when vitamin C is actively supplemented in the form of different foods given to patients suffering from an acute influenza. Kimbarowski points out that because of supplementation with vitamin C the urine becomes less turbid, and bowel movements improve.

The goal of these studies was to clarify the degree of intensity of the urine sediment color reaction in the urine of patients suffering from viral influenza, determine the time required for normalization of the metabolism during recovery based upon the results of the urine sediment color reaction in the urine, and further determine to what extent providing active supplementation of vitamin C to such patients and convalescents affects the metabolic normalization and changes in the intensity of the urine sediment color reaction in the urine.

The studies were conducted with the use of soldiers almost all of whom were of the same age and received the same diet.

The differential diagnosis of severe, moderate, and mild cases of viral influenza that was made was based upon the symptoms, body temperatures, and clinical picture during the period of sickness, and also upon the laboratory results.

The diagnosis of influenza was based mainly on the clinical pictures and epidemiologic data with serological confirmation in a series of cases involving the Type A virus. Observation was done on 130 patients with severe forms of the influenza, 58 with moderate forms, and 26 with mild forms. All of the patients (214) were divided into 2 groups. The 1st group comprised 102 patients (64 with severe forms of the disease, 26 with moderate forms, and 12 with mild forms). During the period of their inpatient treatment and the period of follow-up, ambulatory observation (after clinical improvement and release from the clinic) these subjects were given no supplemental ascorbic acid during a 25 day period, that began with the onset of the disease.

Each of the 112 patients in the 2nd group (65 with severe forms of the influenza, 32 with moderate forms, and 14 with mild forms) received in the same period of time and during their treatment in the clinic and the ambulatory observation period 300 mg of ascorbic acid per day.

It must be noted that the overall number of patients who were followed does not include those who presented with any kind of complications related to the influenza or who displayed any accompanying illnesses, which could have caused a certain degree of intensity of the urine sediment color reaction in the urine.

Ten patients in the 1st group and two in the 2nd group (who were not included in the overall number of 214) suffered complications (bronchopneumonia) on the 6th to the 7th day of illness. During the monitoring of the course of the intensity of the urine sediment color reaction in the urine the anticipated deterioration in the patient’s condition was

visible sooner in that the color of the urine sediment had increased. Monitoring of the course of the intensity confirmed this development more unambiguously than did other laboratory/clinical tests (clinical blood picture, ESR, and X-rays).

Many authors refer to this phenomenon in a series of cases of illness.

Thus, it is emphasized in the work published by I. P. Galuschkin (1959): “By showing an increase in intensity the urine sediment color reaction test signals the impending deterioration almost twice as often as do objective clinical and laboratory results or as can be visually determined by the patient’s state of health. The urine sediment color reaction test signals the appearance of complications more often and earlier than do other clinical and laboratory tests.

The urine sediment color reaction test was performed for our patients and convalescents a total of 1926 times during in-patient care and 3424 times after they became out patients, in other words, once each day per patient.

We once again had the opportunity to show that the technically simple method of urine sediment color reaction testing, which also requires very little time, can be easily performed in any clinic and in every out-patient facility. The urine sediment color reaction test results were divided based on intensity into the following categories: within the normal range (negative), questionable, weak positive, positive, strong positive, and highly positive.

The following symptoms were observed in both groups after onset of the illness: chills, strongly impaired state of health, facial hyperemia, severe headaches, and fever of 38 to 39.8 °C. The clinical blood picture showed in a number of cases an insignificant leucocytosis and rapid blood sedimentation rate, and unremarkable urinalysis, while the urine sediment color reaction in the urine showed various degrees of intensity.

Clinical observations on the 2nd, 3rd, and 4th days produced no significant changes, only drops in temperature down to 37.2 °C along with profuse sweating and general weakness. During this time frame no negative results were obtained from the urine sediment color reaction in the urine in either the 1st or the 2nd group of patients. The results from both groups during in-patient treatment are summarized in Table 1:

Table 1

Group 1 (102 Patients) no Vitamin-C provided			Group 2 (112 Patients) supplemental provision of 300 mg of vitamin C per day	
Degree of Intensity of urine sediment color reaction in the urine				
Negative	0 % of cases		0 % of cases	
Questionable	9.6%		20.1%	
Weak positive	26.6%		38.4%	
Positive	34.8%		24.2%	
Strong and highly positive	29.0%	63.8% [=34.8+29.0]	17.3%	41.5% [=24.2+17.3]
	100.0%		100.0%	

It can be seen from the results listed in Table 1 that for group 1, which received no vitamin C, the percentage total of the positive through the highly positive range of urine sediment color reaction in the urine is 63.8 %, while for group 2, which received active vitamin C supplementation the percentage was at 41.5 significantly smaller.

Toward the end of the 1st week the patients who were suffering from the weak positive and the positive form of the influenza experienced improvement in their general condition, but their state of health continued to be adversely affected, while headaches began and facial hyperemia disappeared. Body temperatures fell to normal levels.

In this period the intensity of the urine sediment color reaction in the urine showed an obvious tendency to decline: In the 1st group the negative urine sediment color reaction amounted to 36.4 % and the positive 63.6 %, while in the 2nd group the negative urine sediment color reaction rose to 59.7 % and the positive fell to 41.3 %.

In this period the clinical blood picture showed in a number of cases leucopenia and a shift to the left.

Observations of the inpatient treatment on the 8th and 9th day showed significant improvement in the state of health of all patients. In all forms of the illness at normal temperatures in the course of two days normalization of the blood picture, the ESR, and the urinalysis occurred. **This applies particularly to patients in the 2nd group** with respect to whom clinical convalescence was determined to exist. During this period the patients in the 2nd group were released, or more properly, the convalescents were released, for follow-up ambulatory observation.

The convalescents in the 1st group were released in most cases 2 to 3 days later. The number of complications in this group was greater than that in the 2nd group.

The results of the urine sediment color reaction in the urine during the in-patient treatment as well as during the follow-up ambulatory observations in both the 1st and 2nd groups are summarized in Table 2:

Table 2

Intensity of the FARK	1 st Group (102 Cases)				2 nd Group (112 Cases)			
	In-patient from 1 st to 12 th day		Ambulatory Observations (following release)		In-patient from 1 st to 9 th day		Ambulatory Observations (following release)	
	No. of Observations.	% of cases	No. of Observations.	% of cases	No. of Observations.	% of cases	No. of Observations.	% of cases
Within normal range (negative)	94	10.1	314	19.2	168	16.7	1067	59.4
Questionable	87	9.3	549	33.6	224	22.2	432	24.1
Weak positive	206	22.4	594	36.4	222	22.1	261	15.0
Positive	361	39.7	154	9.4	282	28.0	32	1.5
Strong positive	124	13.5	21	1.4	86	8.5		
Highly positive	46	5.0			26	2.5		
Total	918	100	1632	100	1008	100	1792	100

The summarized results in Table 2 show that where in the 1st group (period of in-patient care up to 12 days) the total number of the negative, questionable, and weak positive urine sediment color reactions amounted to 41.8 %, in the 2nd group, in which vitamin C was actively supplemented, (period of in-patient care up to 9 days) the number for the same categories was higher, representing 61.0 % of the cases. Similar results were also obtained during the subsequent ambulatory observations: In the 1st group the percentage was 52.8 % of the cases while in the second group it was 83.5 %. During the in-patient treatment the total percentage of the positive and highly positive urine sediment color reactions was 58.2 % in the 1st group and only 39.0 % of the cases in the 2nd group. During the further ambulatory observation the total percentage of the positive and highly positive urine sediment color reactions was 10.8 % of the cases, while in the 2nd group no highly positive urine sediment color reactions were observed and the percentage of the positive urine sediment color reactions was only 1.5 % of the cases.

All of this proves that in spite of the treatment rendered (antibiotics, sulfonamide, salicylate preparations, treatment of symptoms and general care) the urine sediment color reaction in the urine made the disturbed (distorted) nitrogen and protein metabolisms discernable in the course of both observed groups and demonstrated the necessity of

including simultaneous supplementation of vitamin C in the complex therapy in order to normalize the metabolism.

Examinations of the 1st group undertaken on the 25th day after the illness began showed the total percentage of negative, questionable, and weak positive urine sediment color reactions as 89.2 % of the cases and the percentage of the positive as 10.8 % versus in the 2nd group, which actively received supplemental vitamin C (300 mg/day for each patient), percentages of 98.5 % and 1.5 %. Upon release from in-patient care, excreted urine of patients in the 1st group contained only trace amounts of ascorbic acid, while the excreted urine of those in the 2nd group contained 0.3 mg/hr. During the ambulatory observation of the patients (up to the 25th day after the illness began) examination of vitamin C content in the urine produced a similar picture: in the first group less than 0.5 mg/hr and in the 2nd group more than 0.9 mg/hr.

These observations showed that persons who have had viral influenza and who now for all practical purposes are healthy require additional saturation of the organism with vitamin C in order to attain full recovery and normalization of the disturbed metabolism.

Conclusions

1. When patients suffering from viral influenza are treated with complex therapy active supplementation of vitamin C (at least 300 mg/day) is required. When the convalescent state begins, the same dosage of active supplementation of vitamin C must be continued for up to 2 weeks.
2. During the course of the illness the urine sediment color reaction test according to Kimbarowski shows the pathological condition of the organism, the distorted nitrogen (protein) metabolism more precisely than do general laboratory/clinical examinations of the blood and urine, and establish improvement of the oxidation-reduction process as a consequence of the application of ascorbic acid.
3. The urine sediment color reaction test is technically easy to perform. Under ambulatory conditions it constitutes an additional criterion for determining recovery following viral influenza. It also signals impending complications sooner than do other tests.

Summary

[Translator's comment:

The original document sent to this translator contains
a summary in English that is adequately translated.]

English Summary by the authors:

The study described in the present paper aimed at ascertaining the degree of intensity of the coloured precipitation reaction of the urine according to Kimbarowski (FARK) in virus gripe patients during a period of 25 days under clinical and ambulant conditions. 214 patients almost all of whom belonged to one and the same age group and received the usual hospital diet were subjected to daily check-ups.

The authors wanted to determine the date of normalization of the metabolism of acutely suffering and recovering patients. They also wanted to detect in how far the active "C"-vitaminization effects a shortening of the duration of illness, an improvement of metabolic processes and changes with regard to the intensity of the coloured precipitation reaction (FARK) in the urine.

For this reason, the authors compared findings obtained during the process of the disease in a group of 102 patients (64 severe, 26 medium and 12 light cases) who had not received any additional doses of vitamine C with findings obtained in a second group of 112 patients (65 severe, 32 medium and 14 light cases of gripe) who received a daily dose of 300 mg ascorbinic acid during their stationary treatment and outpatient control during the same period.

The total number of patients does not cover those suffering from gripe-induced complications or attendant diseases. Moreover, it does not cover 12 patients of the 1st and 2nd group who manifested a bronchopneumonia as a complication on the 6th and 7th day of illness.

It should be emphasized that FARK signalized the impending complications earlier than other laboratory-clinical examinations (clinical blood and urine tests, blood sedimentation-rate test and radioscopy). The gripe diagnostics was mainly based on the clinical picture, epidemiological data, the serological type A of the virus being confirmed in a number of cases.

The present paper describes the patients' state in both groups on the 2nd, 3rd, 4th, 8th and 9th day of illness, as well as their state during the stage of recovery. The intensity of the FARK in the urine is compared with other tests. The respective results have been summarized in two tables.

The authors demonstrate that during the acute illness and upon release from hospital the number of positive and highly positive FARK in the urine was much lower with the patients who had been actively C-vitaminized than with those patients who had not received any additional supply of vitamine C. Most patients who had received vitamine C were released from stationary treatment on the 9th day of illness, while the patients who had undergone any vitamization were released only 2-3 days later, mostly on the 12th day of illness [*HH comment: this is opposite to the main text, see above*]. These patients manifested complications less frequently than the vitaminized patients. As was proved by the further outpatient observation, the number of positive to highly positive FARK in the urine amounted to 10.8 per cent of the cases in the group without additional C-vitaminization. In the 2nd group we did not observe any strongly positive FARK. The number of positive FARK came up to only 1.5 per cent.

The dynamic observations induced the authors to draw the following final conclusions.

1. In case of a complex therapy of the virus gripe patients an active "C"-vitaminization (not less than 300 mg/day) is required. After beginning of the recovery stage the active C-vitaminization should be carried through in indicated quantities up to 2 weeks.

2. The coloured precipitation reactions according to Kimbarowski reflect the

pathological state of the organism, the distorted nitrogen (protein) metabolism more exactly than general laboratory-clinical examinations of blood and urine, demonstrating the improvement of the oxidation-reduction process due to the application of ascorbinic acid.

3. The FARK can be carried through very simply, and under outpatient conditions it is an additional criterium of recovery following a virus-grippe. It also signalizes impending complications earlier than other tests.