English translation of this paper was kindly arranged by Eva Wintergerst from Bayer Consumer Care AG, Basel, Switzerland, in 2004.

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This translation is located at:
http://www.mv.helsinki.fi/home/hemila/T2.pdf

The German text is available at:
http://www.mv.helsinki.fi/home/hemila/CC/Bessel_1959_ch.pdf as a character copy
http://www.mv.helsinki.fi/home/hemila/CC/Bessel_1959_bm.pdf as a bitmap copy

Comments:

Ritzel (1961) based his work partly on this study by Bessel-Lorck (1959).
See the Ritzel (1961) paper, which is also available as a translation:

Hemilä’s home page:
http://www.mv.helsinki.fi/home/hemila/
Common Cold Prophylaxis in Young People in a Skiing Camp

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During the past 25 years since the introduction of synthetic vitamin C into health science much has been learned in the area of vitamin C - metabolism and the therapeutic application of this substance. For example, we know today that ascorbic acid significantly contributes to the promotion of the synthesis of the building materials of supporting tissues, glycoproteins - among which are immunizing factors such as plasma globulin and antibodies. In addition vitamin C contributes to the synthesis of steroid hormones of the NNR [suprarenal cortex] and is particularly significant as a universal metabolic activator.

Thus, vitamin C increases the natural immunity by activating the general and specific defense mechanisms of the RES [reticulo-endothelial system], the humoral cellular resistive powers and the phagocytic potential of the leucocytes. If when inadequately supplied with ascorbic acid the NNR experiences a rapid depletion of vitamin C as a result of physical or mental strain caused by stress, the result is repercussions to the hormone balance, and a breakdown in the reactive response occurs. Such disorders are most likely to occur in the systems of the young, because during the growing years these systems have a pronounced high need for vitamin C (1).

Scheunert (2) was able to show in his classic studies that, given in sufficiently high dosages, vitamin C prevents illness. Recently, Mieg (3) reported on the successful treatment of colds and flu with high dosages of ascorbic acids, confirming thereby earlier reports from other authors.

I, too, had an opportunity last winter to become convinced of the value a cold prophylaxis based on high dosages of vitamin C. I took part in a 14 day ski trip in the Bavarian Forest along with a group of 46 students from a Berlin secondary school (15 girls and 31 boys), all of whom were born in the years 1942 to 1944.

The environmental conditions prevalent at the ski camp differed from those at home. We found ourselves at 1000 meters above sea level, our diet was completely changed (in lieu of potatoes we ate cereals and breads, almost no fruit, and exclusively dry vegetables), and we spent the nights in community sleeping quarters.

The students themselves were responsible for heating the sleeping quarters, using whatever skills they might possess. The result of which was that when they went to bed "tropical" temperatures prevailed. These temperatures often dropped rapidly due to the low outside temperatures. The students frivolously ignored well-intentioned advice to put on sufficient and warm bed clothes, the result of which was that already on the second day of our stay the first cold symptoms began to arrive. The problem was exacerbated by the unaccustomed altitude and the equally strange unfamiliar skiing activities. During the first few days the weather was distinctly unfriendly; snow storms prevailed. The participants – most of whom were novices on the slopes – were completely drenched following a great number of falls per day. Accordingly, the conditions for upper respiratory infections were very favorable.

After my experiences during three previous ski trips with students, it appeared advisable to me to implement a prophylaxis against the colds that had to be anticipated. Past experience had shown that actual ski injuries play a role that is subordinate to that of colds. The medical care involved mainly bedridden patients who suffered from infection
induced fevers which because of the changed living conditions, took a long time to dis-
sipate in spite of the intensive, therapeutic measures that were taken. In addition, those
who were ill posed a continuous threat to those who were not, and hardly anyone who
shared sleeping quarters with someone who had a cold was spared. It is understanda-
ble that such cold outbreaks have a serious adverse effect upon the fun and purpose of
such a trip – both of which are badly needed by big city children. Serious consideration
had already been given to not undertaking such trips in the future.

Based upon previous extensive experience with the prophylactic administration of vi-
tamin C, it appeared to us that a trial in this regard was in order, particularly in view of
the fact that with the introduction of Redoxon \textsuperscript{®} tablets containing 1 g. (effervescent tab-
let\textsuperscript{1}) it had become possible to administer high doses of vitamin C easily and comforta-
bly.

Before we began the trip the vitamin C saturation point of each of the young people
was checked by titration of the urine with dichlorphenolindophenol ("Roche"). In only two
cases was there a distinct vitamin C deficiency.

When we started our trip, four (of 46) of the students unmistakably already had colds.
Seven students had had infections that had abated 3 days before our departure; in the
case of one girl a cold could be considered to have just ended. Consequently, we de-
parted with 12 subjects who, in the change of milieu that was to be anticipated, provided
the initial basis for a solid outbreak of infections. This appeared to be the case, because
according to my experiences in previous years just such infections that had just been
overcome always reignited very quickly.

In order to be able to adequately evaluate the effects of administering the vitamin C,
the following experimental design was set up:

1. Group 1: 26 young people received 1 effervescent tablet (= 1 g. vitamin C) daily
   beginning on the first travel day and ending on the 7\textsuperscript{th} day of the stay.

2. Group 2: 20 young people received 1 effervescent tablet daily beginning on the 8\textsuperscript{th}
   day of the stay and ending at the end of the trip.

Other than Redoxon\textsuperscript{®} no medications were administered during the entire trip.

**Results**

Group 1: Among the 26 young people, 2 were found who had active colds. These two
received 2 g. Redoxon\textsuperscript{®} daily for 4 days, all of the other young people, among whom
were 4 of the 7 students whose infection had just abated, received 1 g. daily.

Only one boy had a light cold that manifested itself on the 3rd day following the start of
the trip. This cold was treated for 4 days with an increased dose of vitamin C (2 g. per
day). A second student complained on the 4th day of difficulties in swallowing. The only
symptoms were reddening of the tonsillar ring and the tonsils. This locally limited condi-
tion was attributed to breathing through the mouth and – as was later admitted – sucking
on snow.

Because of the administration of the vitamin C, all of the “sick ones” felt vigorous and
fully capable of engaging in physical activities. None was bedridden and none of those in
beds neighboring this trial group became infected.

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\textsuperscript{1} Deutsche Hoffmann-La Roche AG., Grenzach/Baden
It seems to me to be worth noting in this regard that of these 26 young people only 14 slept at home in unheated rooms, 12 of whom slept with a window open even in winter. Of the 6 carriers of infection 5 lived in centrally heated apartments.

Group 2: As was to be expected the results with regard to these 20 young people were completely different. The general condition of those who were already bothered at the start of the trip with runny noses, coughing, etc. (4 had full blown colds, 3 had had infections that had abated) had become worse in the meantime. Two of the students had lain in bed for one or more days. All of them displayed a lack of interest in physical activity. In addition, three new cases of colds were recorded so that nearly half from this group could be identified as no longer healthy.

These 9 young people at this stage received 2 g. of Redoxon® per day over a 4 day period. In only 24 hours significant improvement was noted, and this in the cases of those who were most heavily affected (similar to Miegl's [3] results), and also with regard to the remaining 7 afflicted young people no more feelings of tiredness were present on the 2nd day after therapy was begun. All of them again took part in the skiing, which must be considered a therapeutic success.

However, although vitamin C continued to be administered on the 3rd and 4th day after the trial had begun, 3 new colds developed in 3 of the young people in this group. It is significant that these 3 young people were bed neighbors; probably, too, the duration of the prophylaxis was too short to create adequate resistance. In these cases, too, the symptoms were quickly dissipated with daily doses of 2 g. of vitamin C.

Of this group, 18 live at home in centrally heated premises; 8 sleep in cold rooms, 9 with an open window.

In one case the therapeutic attempts to eliminate the upper respiratory infection with high levels of vitamin C failed. This girl already had a subliminal cold when we started our trip, and in spite of daily doses of 2 g. of vitamin C during the entire trip the cold developed fully and had not yet abated during the return trip. If she had been at home this girl probably would have missed school, whereas here she felt herself to be fully capable and did not miss a day of skiing.

Nine young people from the two groups informed us spontaneously that they considered themselves to be in good shape during the period of trial. If we compare the physical feats accomplished by all participants in this ski camp with those of the participants in the previous year we must characterize them as far above average.

An involuntary experiment toward the end of the stay had a very impressive outcome. Six subjects in the second trial group, who were unable to participate in the skiing due to leg injuries, were surprised during a walk by a sudden drop in temperature and a heavy storm. A planned half-hour stroll through the snow turned into a six and one-half hour trek that included two long climbs. All involved survived this extraordinary stress without any particular symptoms of fatigue even on the following day. Not one of them caught a cold.

The results show that we were able to successfully implement the attempt to achieve a high reduction in morbidity by means of high doses of vitamins, in a situation wherein young people were placed in completely changed environmental conditions and the threat posed by colds was great.

The pleasant way of administering the vitamin C in the form of Redoxon® effervescent tablets proved to be particularly successful.
Summary

Given to a group of 46 young people from a Berlin secondary school on the occasion of a skiing trip in the Bavarian Forest, high doses of vitamin C for the prophylaxis of flu and cold proved to be very efficacious.

One group of the young people (26 subjects) received 1 g of Redoxon® (= 1 effervescent table) daily during the first 9 days. Under this regimen only one student became sick.

In the second trial group (20 subjects) the prophylaxis did not begin until the 9th day. At this point in time 9 students were already sick with upper respiratory infections; and three others became infected within the first three days after the trial began. All of those who were sick were treated with 2 g. of vitamin C per day. Within just 24 hours a rapid improvement in the general condition was evident so that elevated physical demands were met without particular difficulty.

All subjects displayed a significant increase in their capacity to perform physical activities while being treated with vitamin C.

References in the Literature


(Anschrift der Verfasserin: Berlin-Steglitz, Schloßstraße 26.)