

Effects of Korodin Herz-Kreislauf-Tropfen on low blood pressure and cognitive functions in adolescents

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Introduction

The study investigates the effects on elevating low blood pressure in relation to cognitive functions in adolescents.

The efficacy of the phytotherapeutic combination of D-camphor and crataegus berry extract (Korodin® Herz-Kreislauf-Tropfen, -"KORODIN") in young persons aged 14 to 17 years in elevating the low blood pressure was to be evaluated as well as related effects on the cognitive functions at the same time.

Also the tolerability and safety of Korodin has to be assessed for adolescents.

Methods

DESIGN

A RCT -randomized, placebo-controlled, double-blind parallel group design was employed. The study protocol was approved as a clinical study phase III by LMU ethics committee faculty of Medicine and the BfArM (Eudract Nr.)

PARTICIPANTS

100 adolescent participants were recruited. Two groups - the verum group as well as the placebo group – each consisted of 45 females and 5 males. Low blood pressure was defined for males as a systolic blood pressure < 118 mmHg and for females <110 mmHg. Participants had to be judged as healthy on the basis of a thorough anamnestic examination, conducted by a physician.

STUDY DRUGS

Participants of the verum group received 20 drops of Korodin (100g contain 2.5g D- Camphor, 97.3g fluid extract from fresh crataegus berries (drug-extract-ratio 1:1.3-1.5), 0.2 g Levomenthol, Ethanol 60% vol.= 0,48 g Ethanol). One drop of the clear brown liquid contains 39mg crataegus berry extract and 1mg D- Camphor. The placebo group received 20 drops of ethanol (60% vol. = 0,48 g Ethanol), as a brown colored liquid. Both, verum and placebo, were dispensed on a sugar lump.

BLOOD PRESSURE READING

Blood pressure was assessed sphygno-manometrically (RR) by the physician using a calibrated semi-automatic device (*Omron M9 Premium*). Measurements were taken in a sitting position.

TEST MATERIAL

d2 Test of Attention

The d2 Test of Attention allows estimation of individual attention and concentration performance. Two parameters were used in the present study to quantify speed and accuracy of performance: the total number of errors and the number of items processed minus the number of mistakes among the processed stimuli.

Digit Symbol Test

The Digit Symbol Test measures visuomotor speed and selective attention. Participants are required to reproduce as many symbols as possible in blank boxes beneath randomly generated digits, according to a coding scheme, which pairs digits with corresponding symbols. The test score consists of the number of correctly assigned symbols within 120 seconds.

CASE REPORT FORM (CRF)

Anthropometric data, actual or former illnesses, concomitant medications, and adverse events were notes in the CRF. Furthermore, all blood pressure readings and results of cognitive test were recorded.

Results

BLOOD PRESSURE CHANGES

At one minute after substance administration blood pressure changes were significantly higher after verum as compared to placebo- lasting over 5-8 minutes. The respective values for systolic blood pressure were: +4.88 mmHg vs. +2.70 mmHg and for diastolic pressure +3.00 mmHg vs. +1.60 mmHg (see Figure 1). ANOVA statistics for repeated measures for differences between groups yielded $F=6.16$; $p=0.015$ (systolic blood pressure) and $F=6.97$; $p=0.010$ (diastolic blood pressure)- resulting a high significance.

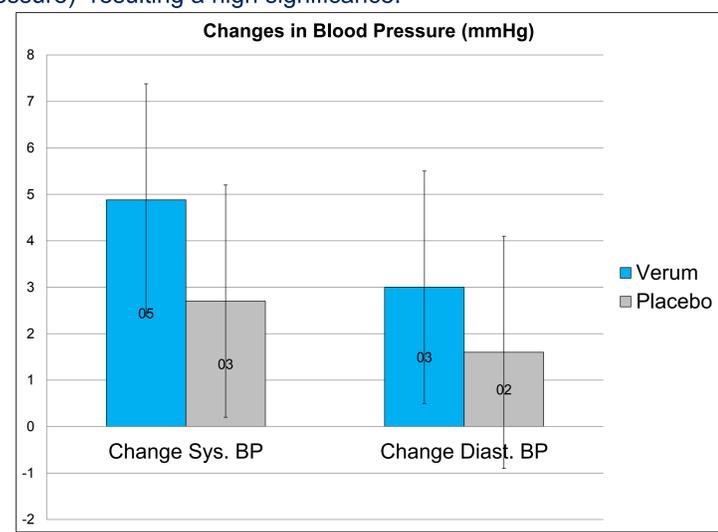


Figure 1. Blood pressure changes one minute after substance administration of Verum or Placebo

COGNITIVE PERFORMANCE

Digit Symbol Test

In the Digit Symbol Test a greater improvement was observed after verum as compared to placebo (change scores 8.5 and 7.4, respectively). However, the difference between groups did not reach the significance level.

d2 Test of Attention

In this test similar changes for the two groups were observed. However, also the difference between groups did not reach the significance level.

PARTICIPANTS' GUESS ABOUT OF VERUM OR PLACEBO ADMINISTRATION

At the end of the session, participants had to judge, whether they had received a Verum (Korodin) or a placebo (Ethanol- Water brown liquid). A Chi-Square test showed that their judgments did not differ significantly from chance ($\chi^2[1] = 3.64$, $p = 0.071$). Both groups couldn't differentiate whether they had received the Verum or a placebo.

TOLERABILITY, COMPLAINTS

In the Adverse Events Form, the physician did not report any events. Correspondingly, the additional interrogation of the participants pertaining to subjective complaints did not reveal any unwanted events.

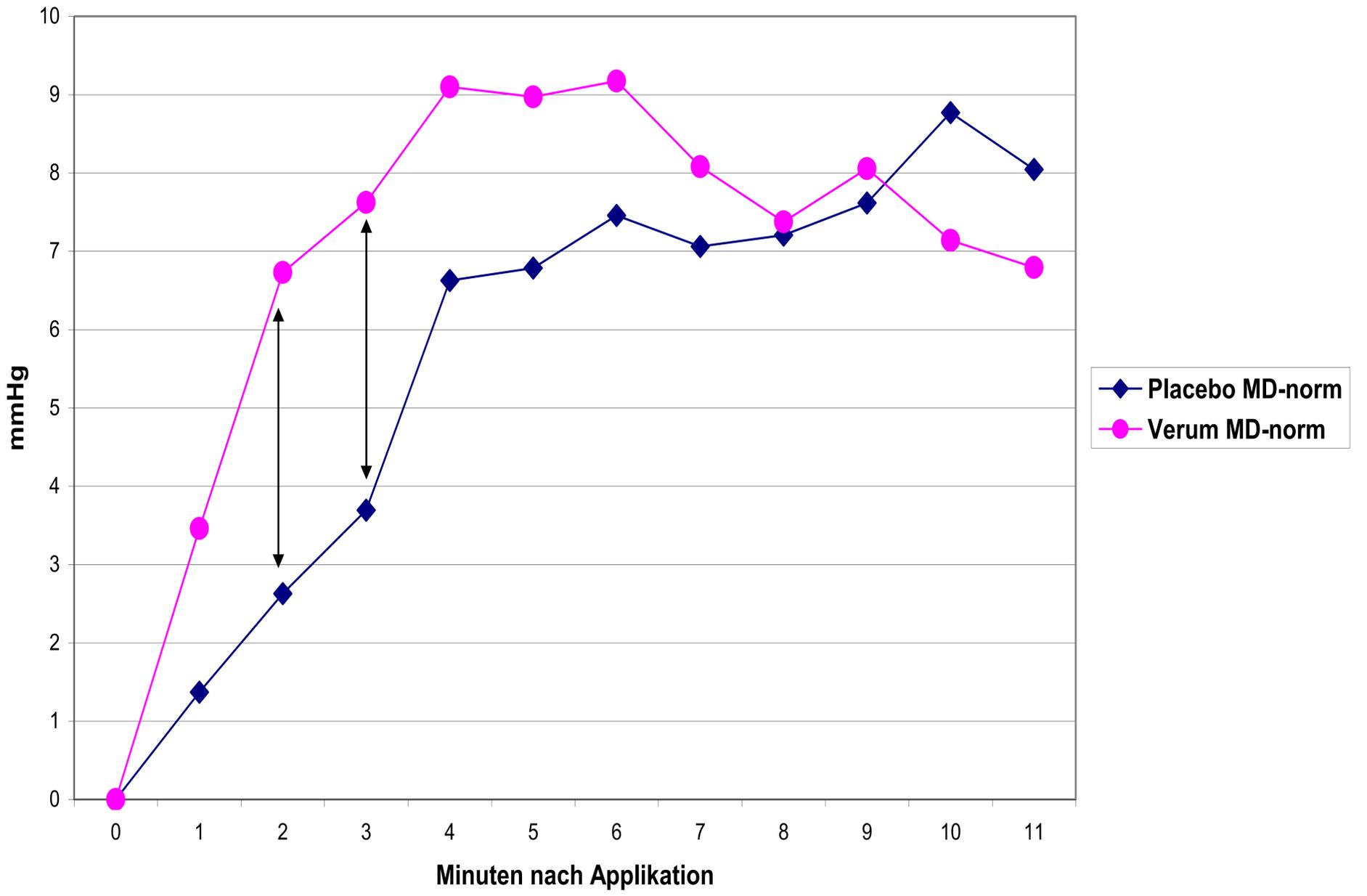
SAFETY

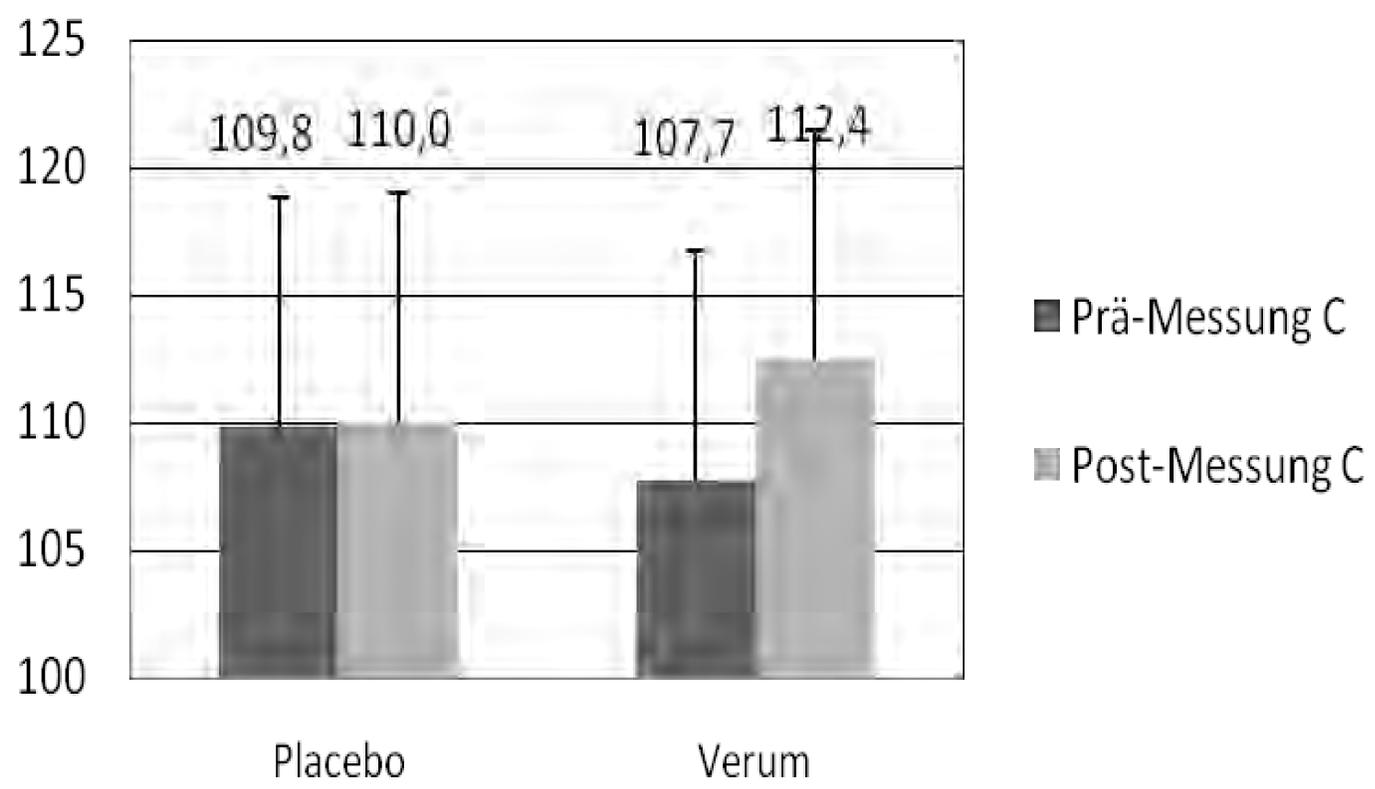
The interview and re-examination by the physician showed no side effects, unknown or known effects, due to verum or placebo in any of the participants.

Conclusion

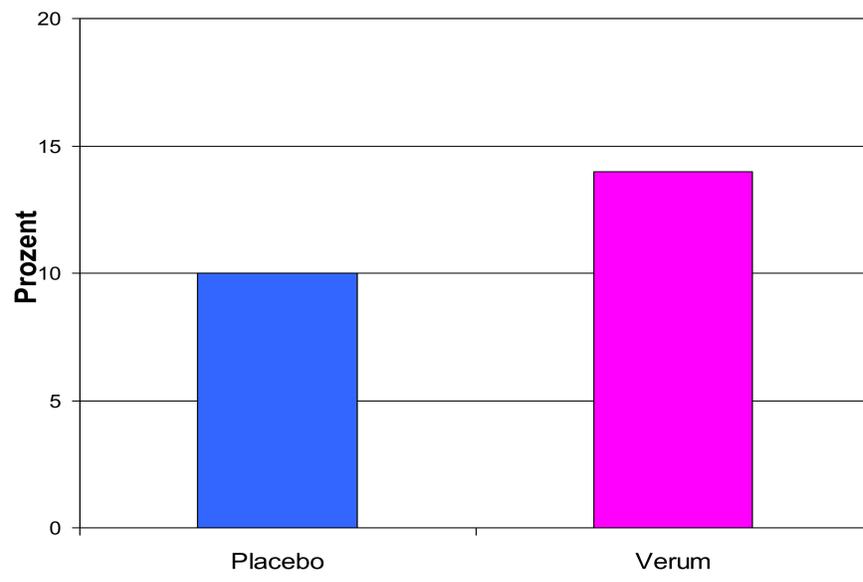
For the age group of adolescents it could be demonstrated that low blood pressure is increased with a rapid onset within one minute by Verum (Korodin). Cognitive performance was improved after verum as compared to placebo, however differences did not reach the significance level. In the test for attention similar changes for the two groups were observed. The examination by the physician revealed excellent tolerability, so as safety of Korodin could be confirmed for adolescents (14 -17 years old).

Anstieg Mitteldruck (mmHg)

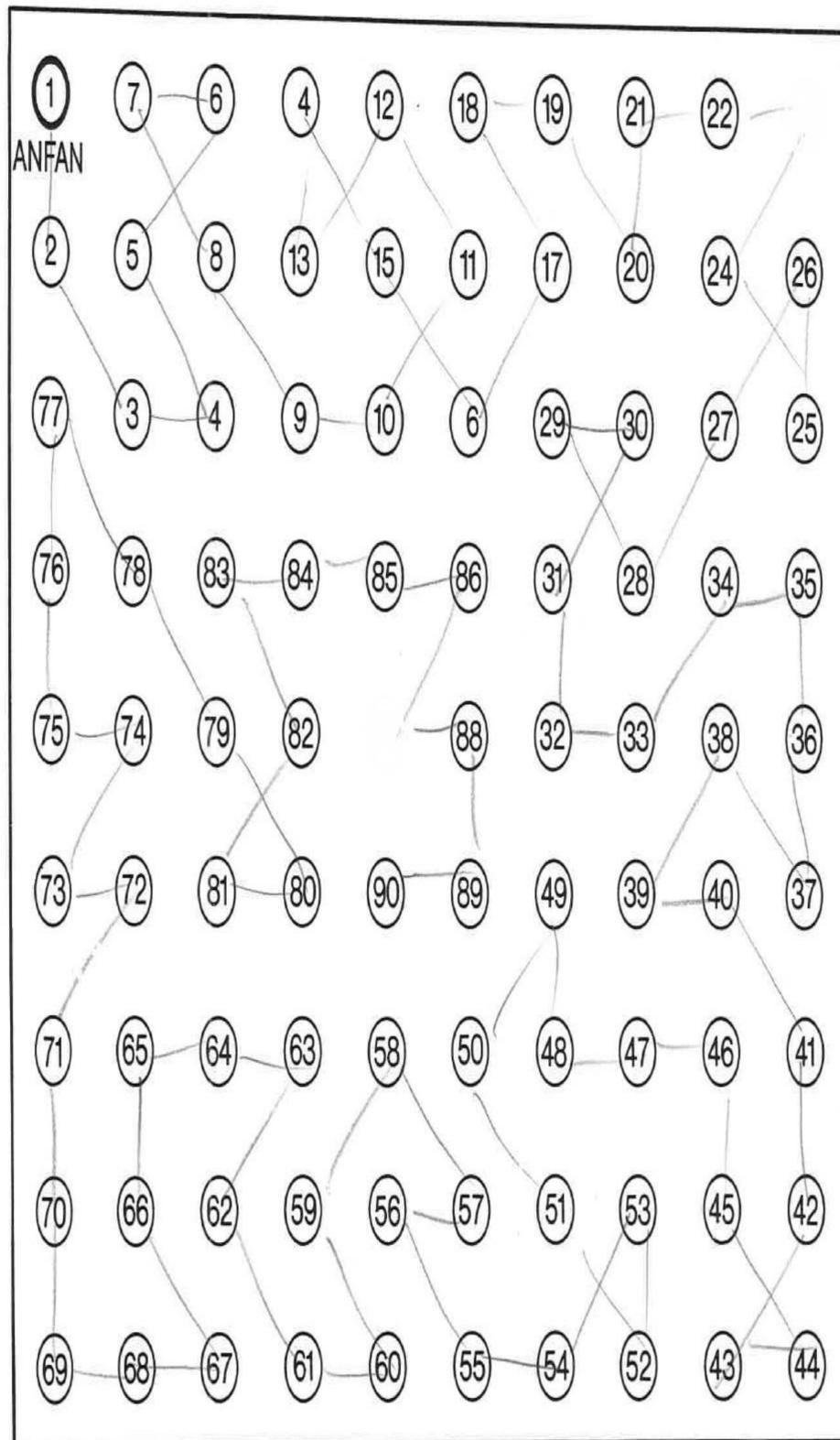




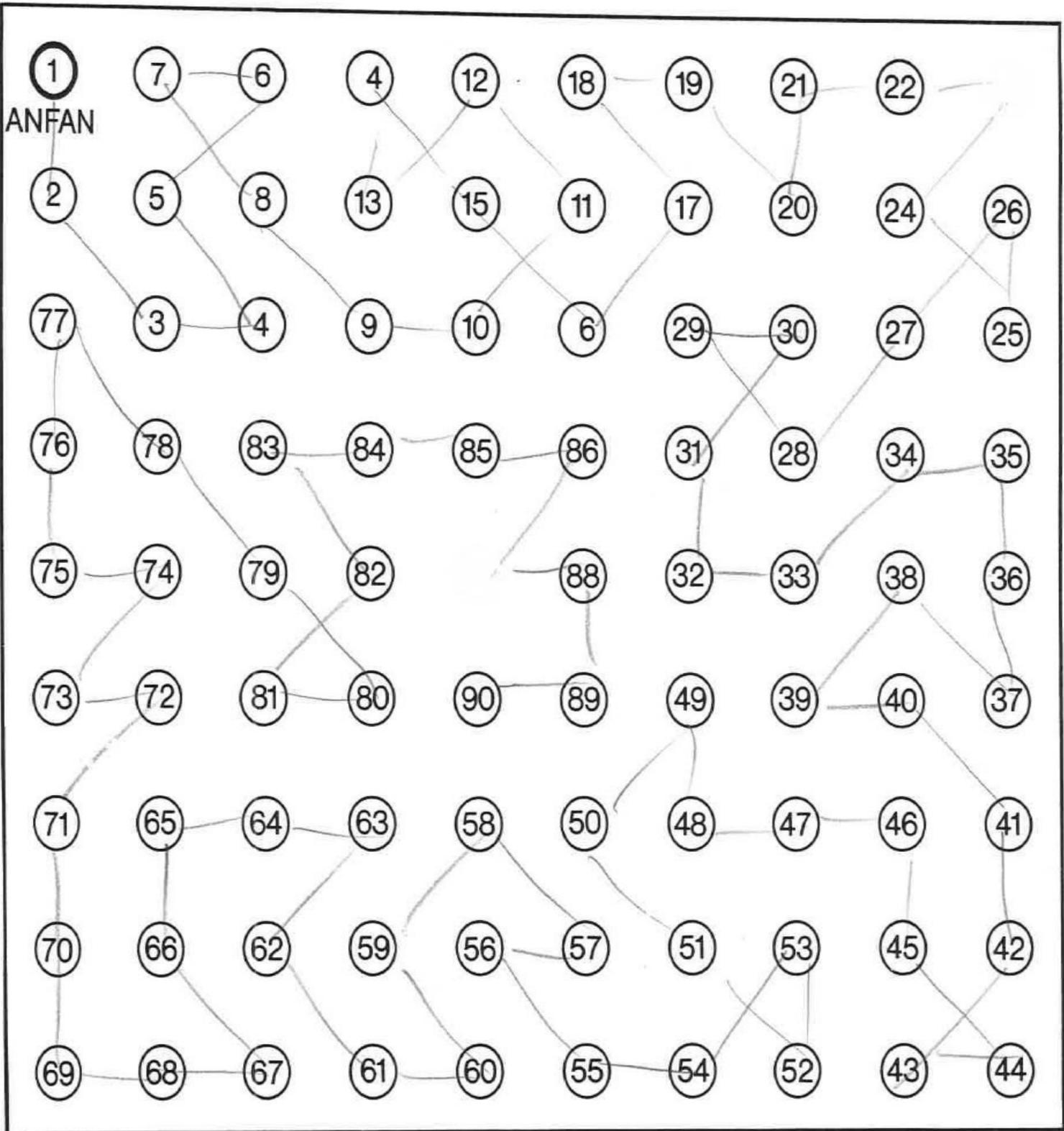
Verbesserungen im Zahlenverbindungstest (ZVT)



zvt ausgefüllt
Zahlenver-
bindungstest



ZVT^{*}
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