

# Effect of Colloidal Metallic Gold on Cognitive Functions: A Pilot Study

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## Abstract

In order to evaluate the effect of colloidal metallic gold on cognitive functions, the revised Wechsler Intelligence scales battery of tests (WAIS-R) was administered to 5 subjects aged 15 to 45 years, before, after 4 weeks on colloidal gold at 30 mg/day and again 1 to 3 months off the gold preparation. The WAIS-R total scores (I.Q) were calculated by adding the sum of the verbal test scores to the sum of the performance scores. After 4 weeks on colloidal gold, there was a 20% increase in I.Q scores with mean + SE of 112.8 + 2.3 pre gold and 137 + 3.8, post gold ( $p < 0.005$ ). Both the performance and verbal test scores contributed equally to this increase in I.Q scores. The effect of the colloidal gold persisted in 3 subjects after 1 to 2 month off gold, where as in 2 subjects who took the tests 3 months after stopping the gold , I.Q scores were down to baseline levels.

## Introduction

It is generally accepted that intelligence or cognitive functioning is the sum of many mental capacities. For this reason, tests that were developed to measure intelligence quotient (I.Q) comprised a series of subtests evaluating the several dimensions of intelligence. Of the several I.Q tests available, educators have found that the Full Scale I.Q score of the Wechsler intelligence scales (WIS) battery, which is calculated from the sum of the individual scores of 11 tests, (6 verbal and 5 performance tests) is an excellent predictor of academic achievement.<sup>1</sup> The revised version of this I.Q test (WAIS-R) has been used extensively to assess the effect of deficiencies and supplementation of specific nutrients<sup>2,3</sup> and the effects of sex, race, age and education<sup>4-7</sup> on mental performance.

Gold is a precious metal which belongs to the transition group I in the periodic table and exists in nature in two basic forms: metallic gold and gold salts. Metallic gold is non-toxic, used extensively in dentistry and is widely available in colloidal form as a nutritional supplement for human consumption. One of us (GEA) has observed a significant subjective improvement of mental performance in 21 adult subjects after ingestion of a preparation of colloidal metallic gold (Aurasol®) for 3 to 9 months at a daily dosage of 15 mg of gold (unpublished). In order to use an objective and more standardized approach in evaluating the effect of colloidal gold on mental performance, the WAIS-R battery of tests<sup>7</sup> was performed on 5 subjects (4 females, 1 male) age 15-45 years, before, during and after the ingestion of the same colloidal gold preparation at 30 mg/day. The results suggest that colloidal gold at 30 mg/day improved significantly the I.Q scores after only one month of administration.

## Materials and Methods

Aqueous dispersion of colloidal metallic gold was prepared by a modification of the citrate reduction method of Frens. The concentration of gold in this preparation (Aurasol®) was 30 mg per ounce of fluid. Five subjects were recruited for this study (4 females and 1 male) with ages ranging from 15 to 45 years. The subjects were evaluated using the WAIS-R procedure.<sup>7</sup> Verbal scores, performance scores and total scores (I.Q) for each subject were calculated. The WAIS-R battery was performed on each subject before gold administration, after ingesting 30 mg of colloidal gold daily for one month, and again after being off the gold preparation for 1 to 3 months. The statistical significance of the data was assessed by Student's paired t test.<sup>9</sup>

## Results

The group of tests called verbal are non-learning and therefore is not influenced significantly by repetition. The performance tests can be learned with repetition and this should be taken into consideration when evaluating the results displayed in Table I. The mean scores + standard error (SE) were respectively for pre- and post-gold administration: verbal 61.4 + 2.4 and 75.4 + 4.5 ( $p < 0.005$ ); performance 51.4 + 0.83 and 61.6 + 1.9 ( $p < 0.01$ ); total scores (IQ) 112.8 + 2.3 and 137 + 3.8 ( $p < 0.005$ ). Since both the verbal (non-learning and performance (learning)

scores contributed equally to the increased values observed in the total IQ scores following colloidal gold, the positive effect of colloidal gold cannot be attributed solely to learning the correct responses on the second test due to repetition.

It is of interest to note that in two subjects (#1 and #2) who repeated the battery 3 months after stopping colloidal gold, the total IQ scores were close to baseline pre-gold levels whereas, in 2 subjects who performed the test 1 month after stopping the gold, (#3 and #5) and in one subject (#4) who did so after 2 months off colloidal gold, the total IQ scores were still elevated above baseline, suggesting that the effect of the gold on mental performance has a carry-over of one to two months after stopping the use of this preparation.

## Discussion

The WIS battery of tests is an excellent predictor of scholastic performance.<sup>1</sup> In fact, according to Lezak,<sup>10</sup> the average scores on a WIS battery provide just about as much information as do average scores on a school report card. We have observed a significant increase (20%) of the mean IQ scores in 5 subjects aged 15 to 45 years after only one month on oral colloidal metallic gold at 30 mg/day. This effect persisted for up to 2 months following discontinuation of the gold preparation. To our knowledge, this is the first study evaluating the effect of colloidal gold on mental performance. Possible mechanisms of action of the colloidal gold preparation are only speculative at this time. However, the potential applications of a non-toxic colloidal metal with marked and rapid positive effect on mental performance are without question of great practical value, not only in scholastic performance but also in the workplace.

The encouraging results of this pilot study warrant further evaluation of colloidal metallic gold in a larger number of subjects of different age groups. Testing various amounts of gold would assist in quantifying the response of the IQ tests in term of cumulative amount of gold ingested in order to investigate a possible dose-response relationship. Using the smallest amount of colloidal gold that results in a desirable effect on mental performance and scholastic achievement would keep the cost of such a program as low as possible.

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