The Effect of Castor Oil Packs on Measures of Liver Function.

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Abstract

Ten subjects (5 experimental and 5 control) participated in a test of the effect of castor oil packs on measures of liver function: processing of caffeine, aspirin, and acetaminophen. The members of the experimental group used castor oil packs (flannel saturated with castor oil and warmed by a heating pad) over the liver for 3 days, 1 hour per day. The members of the control group used dry flannel warmed by a heating pad. Saliva and urine samples were taken to be tested for liver function before and after the 3-day castor oil pack exposure, and analyzed by the Great Smokies Diagnostic Laboratory. There were no significant differences between the pre and post samples for any of the measures of liver function, nor were there differences between the experimental and control groups. Possible explanations include: (1) no effect of castor oil packs on liver function, (2) low reliability of some of the tests, (3) inadequate exposure to the castor oil packs for an effect to be measured.

Introduction

The specific aim of this research project was to evaluate the effect of castor oil packs over the right side of the abdomen on laboratory measures designed to assess the liver's detoxification ability. It was intended as a small trial to collect preliminary data.

Castor oil has a long tradition of use in folklore medicine and is probably the best known Cayce remedy thanks to the work of Drs. Bill and Gladys McGarey. Historically, there is evidence that castor oil has been used medicinally since ancient Egypt. It was known to the Greeks as *Kiki* and to the Romans as *Palma Christi*. Beginning in the 17th century, castor oil was taken internally for its effect as an "irritant" or "stimulant" to cleanse the digestive tract. It has been shown to have a number of direct effects on the gastrointestinal tract when taken by mouth that usually result in producing a diarrhea. This includes the stimulation of endogenous prostaglandin synthesis by the bowel. In the early 20th century, Edgar Cayce recommended castor oil packs as an external application over the right side of the abdomen for a variety of conditions. These were intended to help increase eliminations, stimulate the liver and gallbladder, and dissolve adhesions (McGarey, 1993).

In 1980, the active component of castor oil was identified as ricinoleic acid, a C18, monounsaturated (at C9-10), monohydroxylated (at C12), aliphatic fatty acid (Luderer et al, 1980). Castor oil is generally about 90% ricinoleic acid with minor components of oleic and linoleic acids (Gaginella and Phillips, 1975).

Methods

Ten adult subjects were recruited (3 male, 7 female). None had been diagnosed with liver disease. All had some previous experience using castor oil packs. In addition, during the consent

process, they were informed that review of the literature and search of the "material safety data sheet" on the Internet indicates that castor oil is used in a number of dermatological products and is not expected to present any health hazard from skin exposure. The only cited risk is the possibility of mild skin irritation and redness. They were also informed that the heating pads may produce a skin burn if used incorrectly.

The subjects were randomized into two groups of five. The experimental group used castor oil packs over the right side of the abdomen with heat (produced by a standard heating pad) for 1 hour for three straight days. The control group used heat alone (over dry flannel), also for 1 hour for three straight days. No attempt was made to blind the subjects or experimenters regarding group assignment, since it is difficult to come up with a plausible placebo substitute for castor oil.

Pre and post assessment of liver function using the Great Smokies Diagnostic Laboratory's "detoxification profile" was performed the day before application of the first pack and heat or the heat alone, and again the day after the three day series. This profile measures the livers response to functional challenges with caffeine, acetaminophen, and salicylate. The challenge dose includes 650 mg aspirin, 650 mg acetaminophen, and 200 mg of caffeine.

Twelve hours before beginning the testing, following instructions provided with the test kits, subjects were asked to stop taking any medications that contain acetaminophen or aspirin and to avoid alcohol and substances containing caffeine (coffee, all soft drinks, tea, hot cocoa, chocolate, and certain medications). The day of the testing, they were asked to avoid fruit (particularly raisins and prunes), licorice and peppermint, candies, nuts, and seeds.

The procedure for the detoxification profile involved subjects taking one NoDoz caplet in the morning with water. Two hours after taking the caplet, a sample of saliva was collected. Six hours after obtaining the first sample, a second saliva sample was collected. That evening, two Bayer aspirin and two acetaminophen tablets were taken with water. For the next ten hours, all urine was collected and a sample sent for analysis. During these ten hours, the subjects were not to eat or drink anything but water.

Half the subjects applied castor oil packs over the right sides of their abdomens. This involved soaking wool flannel with warmed castor oil and placing it over the liver, gallbladder, and ascending colon region. This was covered with plastic and then a heating pad set on the "high" setting. This was left in place for one hour. After removing the pack, the skin was washed off with a solution of baking soda and warm water (one teaspoon to one pint of water).

Results

Table 1 shows the means, standard deviations and p values for the associated t-tests for the five measures of liver function, comparing pre and post measures for the experimental and control groups separately. Table 2 shows mean changes from pre to post, with t-tests comparing the experimental and control groups. None of the t-tests was significant at the 0.05 level.

Since there were no differences between the experimental and control groups, the scores were pooled to examine test/retest reliability. Table 3 gives the test/retest correlation coefficients.

Table 4 is a comparison of the means and ranges of the 5 tests with the norms provided by the Great Smokies Diagnostic Laboratory. The caffeine test stands out in being skewed in our sample toward the low end of the normative range, as does the aspirin test (salicyluric acid) with a mean for our sample above the high end of the normative range. Acetaminophen glucuronide is also skewed toward the low end of the normative range.

Discussion

The results provide no evidence for the hypothesis that castor oil packs affect liver function as measured by these tests. Furthermore, even though the sample size is small, roughly equal numbers of subjects got slightly higher scores or slightly lower scores in both the experimental and the control groups, so there is no suggestion that a larger sample might give statistically significant results.

The results do provide some normative data for our sample on these tests, both in terms of normative distributions and reliability. None of the subjects is known to be suffering from liver disease, so it is reasonable that the average scores and the distribution of scores would be close to the norms. For the caffeine test, however, almost all the scores were at the low end of the normal range, whereas for the aspirin test the scores were mostly at the high end of the range. One of the acetaminophen tests also had a mean for our sample at the high end of the range. This suggests that, for these three tests, our sample is very different from the population on which the tests were normed. For the other tests, the scores were distributed across the range, with the mean roughly in the middle.

The test-retest reliability of the salicyluric acid, acetaminophen sulfate, acetaminophen mercapturate, and acetaminophen glucuronide tests is reasonable (from 0.78 to 0.89), but the reliability for the caffeine test is very low (0.21). This low reliability, combined with the preponderance of scores on the low end of the norms provided by the Great Smokies Diagnostic Laboratory, suggests that the caffeine test as it is currently performed and interpreted may not provide useful information (or that our sample is very poor and variable in its ability to metabolize caffeine).

If castor oil packs do, in fact, affect the processing of these substances, there are several possible reasons that the results showed no effect.

First, it is possible that the effect is smaller than the inherent variability in the tests. This is certainly a possibility for the caffeine test, which appeared to have low reliability. But since these tests are supposed to be more sensitive to small variations in liver function when compared to more standard tests such as SGPT, these results are not encouraging, and it would take a very large sample to test this hypothesis.

Second, the effects, particularly in a short exposure to the packs as in this protocol, might be very short-lived. Thus, by the day after the third pack when the post measurement was done, the liver might have returned to its baseline level of functioning. A better method might be to do the test during the third day of pack use.

Third, it is possible that the 3-pack exposure was not sufficient by itself to stimulate the liver to a measurable degree. In a modified protocol, closer to Cayce's typical recommendations, the subjects might use the castor oil packs for four 3-pack cycles over a 1-month period, or even longer, with pre and post measurements.

Fourth, it is possible that, within normal range of liver function, castor oil packs have no effect; an effect might only appear with a seriously low-functioning liver. Thus, another strategy might be to repeat the protocol with people diagnosed with liver disease, perhaps who already had evidence from more standard tests of liver function. Pre and post standard tests could be compared with these less conventional tests.

Finally, it may be worth backing up to ask the question: is there any evidence that the castor oil crosses the barrier of the skin into the bloodstream? A urine test for castor oil metabolites following use of castor oil packs could establish this (e.g, the tests used by Hagenfeldt et al., 1986).

References

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Table 1. T-test comparison of pre and post measures of liver function (n = 10).

Experimental					
	Mean Pre	SD	Mean Post	SD	p (2-tailed)
Caffeine	0.70	0.35	0.70	0.42	1.00
Salicyluric Acid	67.0	6.9	69.2	11.6	0.70
Acetaminophen sulfate	28.2	10.4	29.6	5.0	0.60
Acetaminophen mercapturate	10.8	3.4	11.4	1.7	0.51
Acetaminophen glucuronide	33.6	6.4	38.2	11.0	0.13

Control					
	Mean Pre	SD	Mean Post	SD	p (2-tailed)
Caffeine	0.54	0.13	0.74	0.62	0.58
Salicyluric Acid	44.2	14.2	41.6	15.4	0.52
Acetaminophen sulfate	24.6	11.8	22.4	7.4	0.49
Acetaminophen mercapturate	5.3	2.8	7.7	2.6	0.06
Acetaminophen glucuronide	30.8	11.1	29.2	11.4	0.68

Table 2. T-test comparison of experimental and control groups on changes in measures of liver function (n = 10).

	Mean Expt	SD	Mean Ctrl	SD	p (2-tailed)
Caffeine	0.0	0.2	0.2	0.7	0.57
Salicyluric Acid	2.2	11.9	-2.6	8.2	0.48
Acetaminophen sulfate	1.4	5.5	-2.2	6.4	0.37
Acetaminophen mercapturate	0.6	1.8	2.4	2.1	0.18
Acetaminophen glucuronide	4.6	5.4	-1.6	8.2	0.19

Table 3. Test-retest reliability of measures of liver function as shown by correlation coefficients (n = 10).

	r	p
Caffeine	0.21	0.57
Salicyluric Acid	0.86	0.001
Acetaminophen sulfate	0.85	0.002
Acetaminophen mercapturate	0.89	0.001
Acetaminophen glucuronide	0.78	0.008

Table 4. Comparison of means and ranges for this study and for the norms provided by Great Smokies Diagnostic Laboratory (n = 10).

	10 Subjects		Norms	
	Mean	Range	Mean	Range
Caffeine	0.6	0 – 1.7	1.05	0.5 – 1.6
Salicyluric Acid	55.2	22 – 87	41.5	30 – 53
Acetaminophen sulfate	24.8	9 – 45	26	16 – 36
Acetaminophen mercapturate	9.0	2.5 – 14.2	8.5	5.6 – 11.4
Acetaminophen glucuronide	28.9	13 – 49	41.5	27 – 56