

SPECIAL REPORT ON LAETRILE: THE NCI

LAETRILE REVIEW

Results of the National Cancer Institute's
Retrospective Laetrile Analysis

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Abstract The National Cancer Institute, in response to widespread public interest, undertook a retrospective analysis of Laetrile treatment. Only cases thought to have shown objective benefit from Laetrile were solicited by mail request to 385,000 physicians and 70,000 other health professionals and by direct contact with pro-Laetrile groups. Although it is estimated that at least 70,000 Americans have used Laetrile, only 93 cases were submitted for evaluation. Twenty six of these Laetrile cases had to be eliminated because of insufficient documentation, and an equal number of conventionally-treated cases selected from the Institute's files were added to the records to be analyzed. A panel of 12 oncologists, who had no knowledge of the actual treatments given, was then asked to evaluate the results of 160 courses of treatment (68 Laetrile, 68 chemotherapy, 24 "no treatment") in the abstracted records from 93 patients. The panel judged 6 Laetrile courses to have produced a response (two complete and four partial). These results allow no definite conclusions supporting the anti-cancer activity of Laetrile. The National Cancer Institute will use the data in deciding if further study is needed.

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Laetrile, a cyanogenic glycoside, has been estimated to have been used for over two decades by at least 70,000 patients for palliation, prevention or cure of cancer. Many physicians view this treatment as quackery or, at best, a placebo. The history of Laetrile has been reviewed in both lay^{1,2} and medical publications.^{3,4} Laetrile has shown no reproducible antitumor activity in extensive animal experiments;⁵⁻⁹ its safety has been questioned;¹⁰⁻¹³ and review of data for patients treated with Laetrile has not provided con-

vincing evidence of efficacy.⁴

In response to public demand some prominent physicians called for a prospective clinical trial of Laetrile.¹⁴ Others were opposed,¹⁵ primarily on ethical grounds and because they did not wish to establish a precedent for clinical tests of drugs that showed no promise in preclinical studies, especially when other therapies with preclinical promise are constantly becoming available. For these reasons, after a period of planning with other government agencies,* the National Cancer Institute initiated a nationwide search for documented responses to Laetrile.¹⁶

MATERIALS AND METHODS

Case Solicitation

Patients thought to have shown an objective beneficial antitumor response to Laetrile were sought through national publicity, including a press conference, articles in the medical and lay press, contact with known pro-Laetrile groups, and the distribution of 455,000 letters (385,000 to physicians plus 70,000 to other health professionals, such as pharmacists, hospital administrators and officials in health departments). No attempt was made to seek non-responders or to establish the total number of patients treated with Laetrile. Eligibility required consent of the patient or

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next of kin (if deceased), confirmatory histologic material, measurable disease, adequately documented history, use of Laetrile with or without "metabolic therapy" (special diet, vitamins, minerals, enzymes and chelating agents) for a period of at least 30 days with a preceding interval of at least 30 days in which no conventional therapy was given, and records written in English. Assurances were given that the Food and Drug Administration would not be involved with review or collection of the data and that no legal proceedings would be instituted on the basis of data accumulated.

Extensive and complete information was requested concerning diagnosis, therapy, and progress of each patient from physicians, clinics, hospitals and laboratories known to have been involved in the care of the patient. Scans and x-rays, laboratory reports, admission or outpatient history and physical exams, sequential office or outpatient records, operative or procedural summaries, medication records, pathology reports, discharge or death summaries, radiation-therapy summaries, autopsy reports and death certificates were sought. All pathological material received was reviewed at the Armed Forces Institute of Pathology to confirm the diagnosis of cancer.

Review Mechanism

Summaries of Laetrile-treated cases containing all pertinent objective and subjective data were presented to a review panel consisting of 12 experienced clinical oncologists not on the staff of the National Cancer Institute.† Summaries taken from the Institute's files of an undisclosed

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number of cases treated by conventional therapy were also presented. Some of these patients had intervals of no treatment. For NCI cases, data were often deleted so that they would more closely resemble the Laetrile-treated cases for which we usually had less information. Some Laetrile-treated cases had intervals of "no treatment," as well as treatment with "conventional therapy." In each summary, one to three "interventions" were to be evaluated and these were designated simply by the letters X, Y, and Z. Radiation or surgical therapies were always explicitly mentioned. The panel was, of course, kept unaware of which intervention ("no therapy," Laetrile treatment or "conventional therapy" consisting of chemotherapy or hormones) was being evaluated in each instance. It was first asked to decide for each blinded treatment course whether data were sufficient for any analysis. If so, the response was then classified as "non-evaluable" (see Table 1 for definitions) or as "complete response," "partial response," "stable disease" or "progressive disease." In addition, the panel was asked to decide whether increased disease-free interval, increased length of life, decreased complications or other benefits could be attributed to that treatment course. Finally, the reviewers were asked to state whether they believed the intervention given was "no treatment," conventional therapy, or Laetrile. Every reviewer evaluated each summary independently, after which there was a group discussion in which a majority consensus was obtained for each treatment course of each case. After group evaluation the panelists had the option of

reviewing all available information on any case, an option taken only once.

In addition to the cases studied in the manner described above, the panel was presented in an unblinded fashion with 11 translated case histories and supporting laboratory data submitted by the director of a Mexican clinic who believed these cases showed beneficial antitumor effects from Laetrile.

Statistical Analysis

The design of this review does not permit statistical analysis of the results except with respect to the efficacy of the blinding procedure. No direct comparison of the three types of intervention (Laetrile, conventional chemotherapy, "no treatment") is possible because neither the Laetrile cases nor those taken from the Institute's files were randomly chosen. The only Laetrile cases solicited were those believed to have responded favorably, whereas the NCI cases were deliberately selected and abstracted to be similar to the Laetrile cases. The courses of conventional treatment and "no treatment" were included not for statistical comparison with the Laetrile treatment but simply in an attempt to "blind" the panel and thus minimize any pro- or anti-Laetrile biases that may have existed. The kappa statistic¹⁷ was used for assessing agreement between reviewers' guesses and actual treatment.

RESULTS

Case Solicitation

Although only beneficial antitumor responses were solicited, we received replies from 220 physicians who, as a group, claimed knowledge of more than 1,000 patients showing no beneficial response to Laetrile.

Nineteen physicians said that they had followed patients showing only subjective responses to Laetrile. Two-hundred thirty patients or their next of kin were asked to release their records for study. The names of some were obtained in response to the nationwide mailing and the others were publicly on record as having benefited from Laetrile. In only 93 of these 230 cases were authorizations for release of medical records received, permitting us to seek further information. Twenty-six of these 93 patients were not presented to the panel because it was obvious that data were insufficient for evaluation according to the criteria for review. Information was obtained for the 67 remaining Laetrile-treated cases by contacting 393 physicians, clinics, hospitals or laboratories either once or repeatedly. Information was received from 81 per cent of those contacted (from 35 of 49 physicians who treated patients with Laetrile and from 283 of 344 for all other contacts).

Evaluation of Therapies

Altogether, 22 tumor types were represented: 15 types for 26 patients who did not receive Laetrile, ranging from one to four patients for each tumor type; and 22 tumor types for the 67 Laetrile-treated patients, with a range of 1 to 11 patients per tumor type.

The panel was asked to evaluate 160 treatment courses for 93 patients. Forty-one patients received only one course, 37 received two courses, and 15 received three courses of treatment. The actual interventions for these 160 courses were 24 "no treatment," 68 Laetrile (with or without metabolic therapy) and 68 chemotherapy.

The results of the panel consensus for the 68 Laetrile treatment courses appear in Table 1 along with information as to how the panel voted. Details concerning the two patients judged to have complete responses and the four

judged to have partial responses appear in Table 2. Three additional patients were judged to show increased disease-free interval, although Laetrile was used when there was no definite followable malignant disease. The diagnoses in these three cases were Stage III testicular embryonal cell carcinoma, Stage III ovarian adenocarcinoma, and a malignant tumor in an axillary lymph node, probably metastatic. The panel also judged that one "no treatment" intervention for a Ewing's sarcoma showed a partial response.

Overall, the judges would have been expected to guess the intervention correctly in about 41 per cent of treatment courses. In fact they guessed correctly in about 65 per cent ($P < 0.001$) despite our efforts at blinding the treatments. However, a consensus of the panel believed that the treatment was chemotherapy for the six Laetrile-treatment courses judged as partial or complete responses and the three Laetrile-treatment courses judged to show increased disease-free interval.

In reviewing the 11 Mexican cases, one was judged as having insufficient information, nine as non-evaluable (either due to concurrent therapy with conventional antitumor agents or inevaluable disease) and one as showing progressive disease.

DISCUSSION

Despite widespread publicity and intensive efforts, the 67 Laetrile-treated cases presented to the review panel were far fewer than the 200 to 300 that we had hoped to obtain.¹⁶ We have no way of knowing whether reluctance to submit cases, paucity of objective antitumor responses to Laetrile, or other reasons explain our difficulty in collecting cases. Since only 81 per cent of those individuals contacted supplied information, our findings

should be interpreted with caution.

The judgment that many cases had insufficient information or were not evaluable should in no way be taken as criticism of the management of these patients, since in treating patients, one often uses several treatments together in the desire to help the patient rather than to evaluate the effects of a single therapy. Also, it should not be construed that these patients showed neither improvement nor progression of disease - they were simply not evaluable for our specific purposes. The lack of unanimous agreement in judging responses is not surprising. Universal agreement about criteria for response does not exist, especially when a variety of tumor types are considered and clinical experience varies.

The objective of this retrospective analysis was to see if it would be possible to document beneficial objective anticancer responses to Laetrile. We cannot dismiss the possibility that the six patients in Table 2 responded to Laetrile, but the design of this study in no way allows us to draw this conclusion. Submission of incorrect clinical interpretations, falsified data, intentional or unintentional omission of data (for example, concurrent conventional therapy), the possibility that we were unaware of some physicians treating these patients or non-response to our inquiries must all be considered in interpreting these findings. It should be emphasized that the 67 Laetrile-treated cases analyzed in this report cannot be identified as the denominator for the six Laetrile-treated patients that were judged to be responders. These 67 cases were submitted for review because they were thought to demonstrate Laetrile's anti-cancer effects. Only patients showing a beneficial response were solicited, and no attempt was made to review the effects of Laetrile in all the other 70,000 or more patients in whom this agent has been used.

Other explanations for the six apparent responses to Laetrile are, of course, possible. Spontaneous regressions of tumors, although rare, have

been documented in at least 176 cases, with frequency varying by tumor type.¹⁸ Even in the absence of true spontaneous regression, the well documented variability in the natural history of some tumors may confuse interpretation¹⁹ and, in fact, the panel judged by consensus that a partial response occurred in one case receiving no treatment during the course evaluated. The patients treated with Laetrile were almost always given concomitant metabolic therapy, including substances that might be regarded as immune stimulants, as well as general supportive care measures such as improved diet, psychologic support, and the unmeasurable ingredient of hope. This fact makes it difficult to attribute any tumor responses to Laetrile alone.

Despite the fact that the panel identified the correct treatment more often than would have been predicted by chance, a consensus guessed chemotherapy for those Laetrile treatment courses judged as complete or partial responses and those judged as showing increased disease-free interval. This finding can be interpreted as demonstrating that these treatment courses were in fact given a fair review. Although a more thorough evaluation might have been possible by allowing the panel to examine the records submitted to us, we felt that blinding was more important in order to avoid charges of anti-Laetrile bias by the review panel.

This retrospective analysis illustrates the difficulty of drawing inferences about therapeutic efficacy in the absence of properly designed randomized trials. The results of this analysis and other information on Laetrile will be used by the National Cancer Institute to determine whether further study is justified.

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Table 1. Evaluation of Laetrile treatment courses by panel consensus

Panel consensus	Number of Laetrile treatment courses	Number of dissenting panelists					
		0	1	2	3	4	5
Insufficient data	11	2	2	1	4	1	1
Non-evaluable (NE) ¹	35	17	8	3	3	3	1
Complete response (CR)	2	0	0	0	1	0	1
Partial response (PR)	4	0	1	0	3	0	0
Stable disease (ST)	9	0	1	2	1	2	3
Progressive disease (PG)	7	1	2	2	1	0	1
Total	68 ²	20	14	8	13	6	7

¹21 patients with no followable disease, 12 with concomitant conventional antitumor treatment, 1 with non-malignant disease on review, 1 with more than one of the preceding reasons.

²One patient had two separate courses of Laetrile separated by a 12 month interval.

Table 2. Laetrile-treated patients judged by panel
consensus to have complete or partial responses

Case #	Tumor type	Individual				Treatment			Comment
		opinions ¹				guesses ²			
		NE	CR	PR	ST	N	L	C	
34	Nodular well-differentiated lymphoma (IIIA)	1	9	2	0	0	1	11	Regression of palpable lymph nodes
73	Squamous cell carcinoma of the lung	1	7	4	0	0	0	12	Bronchoscopic and radiographic improvement
79	Metastatic carcinoid	0	0	11	1	0	0	12	Reduction of palpable abdominal mass and decreased 5HIAA
33	Intraperitoneal papillary adenocarcinoma, primary unknown	2	0	9	1	0	0	12	Reduction of palpable abdominal mass
93	Nodular sclerosing Hodgkins (IVB)	2	0	9	1	0	3	9	Radiographic improvement of biopsy-proven pulmonary nodule
68	Hilar node adenocarcinoma, probable lung primary	3	0	9	0	2	2	8	Radiographic resolution of an un-biopsied pulmonary nodule

¹See Table 1 for abbreviations.

²N = no treatment, L = Laetrile, C = chemotherapy