Poly-MVA as an Integrative Approach to the Treatment of Cancer: Evidence-Based Through Case Reports

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What Is Poly-MVA?
Poly-MVA is a proprietary formulation that contains palladium, alpha-lipoic acid, thiamine, riboflavin, cyanocobalamin, formyl-methionine, and N-acetylcysteine. Its main active ingredient is a lipoic acid/palladium complex (LAPd) that is sold as a dietary supplement and is being considered by the pharmaceutical industry under several patents as "synthetic reductase." The initials "MVA" stand for "minerals, vitamins, and amino acids." LAPd complex has undergone extensive toxicology study, both intravenously and orally. Mice were administered doses of 5,000 mg/kg (a typical human dose is 20 mg/kg). Because no deaths or signs of organ damage occurred in the test animal, it was concluded that the LD₅₀ of LAPd exceeds 5,000 mg/kg. The same independent lab conducted an Ames test, which was negative.

Mechanism of Action
LAPd was also studied for its effectiveness in halting the growth of glioblastoma cells in vivo. Glioblastoma tumor cells were injected into the neck of Swiss nude mice. When the tumors had grown to 200-400 mm, the mice were divided into eight groups of ten. Four groups were given daily intravenous doses of either LAPd or placebo, and four groups were given intraperitoneal LAPd or placebo. Those who were given LAPd received doses of 1.0, 1.5, 2.0, or 2.5 mg per mouse for a total of four weeks. At the end of four weeks, tumor volume was assessed. All of the mice receiving LAPd intravenously or intraperitoneally had significant reduction in tumor size (50% or more) compared to those who received the placebo. Dosages of 1.0-2.0 mg are comparable to those dosages used in humans adjusted for body weight.

Poly-MVA's proposed mechanisms of action are directly related to its structural formulation. It consists of an irreversibly bound trimer of lipoic acid and palladium with a thiamine core. This complex is a liquid crystal polymer rather than a single molecule, which allows it to provide a unified redox effect more efficiently. When glucose enters a cell, it is broken down, in the absence of oxygen, into pyruvate, which subsequently enters the mitochondria and is quickly oxidized to acetyl-coenzyme A (acetyl-CoA). In aerobic respiration, acetyl-CoA is then channeled into the Krebs/citric acid cycle to create the reduced form of nicotinamide adenine dinucleotide (NADH). NADH donates its electron to the electron transport chain to drive the phosphorylation of adenosine triphosphate (ATP). The energy needs of the body are supplied by splitting ATP into adenosine diphosphate (ADP) and a free phosphate molecule. LAPd was created to shunt electron energy from itself to DNA and thus replace the electrons lost in normal cells as a result of the oxidative damage associated with radiation and chemotherapy.

Studies have demonstrated that LAPd provides electrons to DNA via the mitochondria. This electron transfer provides an additional energy source to normal cells. However, cancer cells are metabolically challenged and function in a hypoxic environment. Since excess electrons have less oxygen to accept them in the cancer cell, a local generation of free radicals occurs at the mitochondrial membrane. This activates apoptosis by facilitating the release of cytochrome C from the inner mitochondrial membrane, allowing the formation of an apoptotic complex in the cytoplasm. This complex results in the subsequent activation of the caspase cascade of enzymes that destroy the malignant cells. Given that healthy cells are richly oxygenated, LAPd is nontoxic to them, and they actually benefit from the energy boost.

Recent findings have focused on the role of Poly-MVA and the potential of a malignant cell to adapt physiologically.
to a hypoxic environment. These physiological changes are mediated by a molecule called hypoxia inducible factor-1 (HIF-1), which increases in hypoxic conditions to promote an increase in vascular endothelial growth factor (VEGF, a promoter of angiogenesis); glucose transport 1 (GLUT1); glycolytic enzymes (critical components in anaerobic respiration); and erythropoietin (EPO; responsible for the differentiation of red blood cells). Poly-MVA appears to decrease the production of HIF-1, thus restricting the ability of the cell to adapt to its environment and subsequently making it more vulnerable to apoptotic cell death.

Case Study 1

FA was diagnosed with stage 4, non-small cell lung (NSCLC) cancer at age 61. She was given taxol and carboplatin from July 2004 until the end of September 2004. According to a CT scan, the tumor's size decreased by 50%. During this time, she suffered two heart attacks, one that was silent after being given a flu shot on October 1. She underwent a catheterization, and two complete blockages were found. The chemotherapy and the heart attack destroyed part of her heart muscle. She was put on medications, and bypass surgery was not recommended because of her history of cancer.

Since her heart was affected by the chemotherapy, she could no longer tolerate any chemotherapeutic drugs. Her lung cancer seemed to be stable, and her oncologist wanted to switch her to Iressa. However, she couldn't afford it, and her insurance provider refused to cover this very expensive drug. She went to see an integrative physician who told her about Poly-MVA. In October, she started taking Poly-MVA and quickly worked up her dose to eight teaspoons per day. Five months later, her CT scan of her chest revealed no tumors. There was no longer evidence of lung cancer. Her heart condition was also stable.

In December, she decreased her dose of Poly-MVA to one teaspoon per day. Additionally, she takes 100 mg of CoQ10 and four capsules of fish oil each day. She has regular checkups with her oncologist as well as regular CT scans. If there is any recurrence, she will immediately increase her dose of Poly-MVA to eight teaspoons per day. Her oncologist told her after her remission that only ten percent of people diagnosed with NSCLC are cured (generally not stage 4) and that, in general, it can only be controlled. The oncologist had told FA that she had at most one year even with aggressive treatment. Iressa was taken off the market shortly after being recommended to her. The oncologist now told the patient, "whatever you are doing—keep doing it." In June 2007, FA's oncologist received laboratory results and told patient that she is doing great and remains in remission.

Update 1/22/08: A comparison X-ray was performed on 12/19/08 by her oncologist and compared to her X-ray on 10/07/05. The report is as follows: "The cardiac silhouette is not enlarged. The pulmonary vasculature is within normal. No acute lobar infiltrate or pleural effusion is seen. Left central venous catheter is unchanged in appearance. No pneumothorax. Mild degenerative changes thoracic spine. Degenerative changes both shoulders. Impression: no radiographic evidence for acute chest process." FA remains in full clinical remission.

Case Study 2

BB was diagnosed with stage 4, non-small cell lung cancer (NSCLC) in June 2005 at the age of 74. She had a compression fracture (which was later determined to be from the malignancy) and was scheduled to have a kyphoplasty (cement put in her spine). It was cancelled because an X-ray showed a nodule in her lung. Her biopsy, CT, and MRI confirmed the diagnosis. Her oncologist recommended ten radiation treatments to her vertebrae and Tarceva, which she started immediately after diagnosis in mid-June. This was for palliative care only. She started taking Poly-MVA approximately at the same time her treatment started. She immediately went up to eight teaspoons a day. On August 29, 2005, she had a follow-up CT and PET scan showing that the tumor was stable and no growth had occurred. The oncologist was pleased and surprised.

BB was being monitored approximately every two months. She started Zometa in September 2005. In October 2005, her CT scan revealed complete resolution of the tumor. Her oncologist was shocked. In his clinical experience, he had not witnessed a remission of stage 4 NSCLC. He told both her and her daughter that she is doing better than 95% of his patients and that the conventional treatment was only an attempt to slow progression. She later found out from her daughter (when she was in remission) that the oncologist said she had only eight months to live even with aggressive treatment. Tarceva and radiation does not cure stage 4 NSCLC; it may at best improve disease-free survival, not overall survival. Her subsequent CT scan and bone scan on July 11, 2006 and May 7, 2007 PET scan still demonstrate complete remission of the cancer, including the metastasis to her lumbar and thoracic lesions and several lymph nodes. She no longer has any hypermetabolic uptake in her PET scan evidenced at diagnosis and in August 2005. Her quality of life is 100%, although she takes care of her homebound husband. She reduced her dose of Poly-MVA to two teaspoons a day in February 2007.

She is being monitored with alternating CT, PET, and occasional bone scans approximately ever four months. The time between scans continues to increase as she remains in remission. If at any point in time there is evidence of tumor growth on the scan, she will immediately increase her Poly-MVA dose to eight teaspoons a day or more. Her oncologist recently took her off Zometa which she had taken for two years. An X-ray on July 12, 2007 was negative for cancer and
otherwise normal. For many years, BB has been taking lasix and potassium for peripheral vascular disease as well as CoQ10 and several other vitamins, minerals, and antioxidants.

Update 9/26/07: New CT scan report on 9/4/07 – No evidence of significant mediastinal, hilar, or axillary adenopathy. A 3.5 mm hypotenuating lesion within the right lobe of liver is unchanged and represents a cyst, and a small renal cyst is also seen. Scattered lymph nodes are not enlarged by size criteria. The spleen, pancreas, adrenal glands, left kidney, stomach, and duodenum are unremarkable in appearance. A right hip replacement is visualized. A 11 mm nodular density in left lower lobe and 3 mm ovoid nodular density in the lingual are unchanged from the prior study (CT scan). Stable hepatic, right renal cysts.

Update 9/26/07: New NM bone scan whole body on 9/4/07 – The increased activity of the upper thoracic spine seen on the current study was present on the prior examination (7/11/06), but it is much less intense today. Mild activity within the lumbar spine was present on the prior examination as well and is likely degenerative and is unchanged. Oncologist viewed both reports and considers patient in remission.

Case Study 3

JS was diagnosed with glioblastoma stage 4 in December 2003 at the age of 48. He was told it was very aggressive, and it doubles every seven to 14 days. In the same month, he had surgery where all visible brain tumor was removed. He also went through 33 rounds of intensity modulated radiation therapy and rotating gamma. He completed his treatments by February 2004. He refused any chemotherapy and Temador and was told by his oncologist that the Christmas he celebrated in December would be his last. However, he did take Dilantin since he had previous seizures and wanted to prevent another one from occurring. Even with follow-up chemotherapy and Temador, he was told that it was unlikely he would survive more than one year.

He started taking Poly-MVA in January 2004 and quickly went up to eight teaspoons a day. In September 2004, his PET scan was completely clear with no positive uptake findings. In October 2004, he had a grand mal seizure, and his surgeon told him that the glioblastoma was back. However, his oncologist suggested that the seizure might be due to radiation damage. His surgeon disagreed with the oncologist and said, “The likelihood of radiation damage (rather than a return of the cancer) was equal to the Cubs winning the World Series three times in a row.” His seizure medication was changed to Trileptal and Keppra due to a rash he was experiencing from the Dilantin. Whatever the cause, it was creating more intense and more frequent grand mal seizures, slurring of speech, and impairment of motor skills.

Exploratory surgery was performed on October 2004. The pathology report revealed that 98% of the tissue was necrotic (due to radiation damage) and two percent of the tissue was “unknown.” There was no evidence of any cancer. Because the surgeon still could not believe the results, three more pathology reports were sent out. All of them came back negative for cancer. He received no further conventional treatment and stayed on the seizure medication. Decadron was added to reduce pre- and post-surgery brain swelling. His oncologist orders an MRI every few months to monitor his progress. Each one has been clear of cancer. A suspicious area that was in an MRI in September 2006 was actually due to healing. A later MRI performed in April 2007 revealed that the radiation damage is shrinking. Both his oncologist and surgeon told him that they rarely ever see patients live this long and do this well, even if they took the chemotherapy and Temador.

JS remains in remission. His quality of life is up to 90%. He is very physically active and runs a full-time business. He has some residual short-term memory loss, which seems to occur when he is under stress. He also experiences periods of fatigue. Both of these issues are improving over time. He remains on a maintenance dose of two teaspoons of Poly-MVA per day. He has been on this maintenance dose since September 2006. He will increase the dose immediately if at any point in time his MRI reveals any possible cancer activity.

Update: 9/26/07: MRI completed on 08/27/07: Continuous diminished size of the cavitory lesion and a tiny enhanced nodule in the right frontoparietal lobe since the previous study. The findings have improved when compared with the previous study on 6/25/07. The findings are consistent with surgical scarring with necrosis. Disappearance of one of the tiny nodules when compared with the previous study. Oncologist told patient he continues to heal and is doing excellently.

Update on Previously Reported Case of Multiple Myeloma

KW died on November 9, 2006. Prior to the spring of 2006, KW started to feel very tired and needed to sleep during the day. He had continued the thalidomide. However, prior to the spring of 2006, he had stopped taking the Poly-MVA regularly again and took it at best intermittently. His red blood cell count became extremely low, and he required several transfusions during the spring of 2006. His physician prescribed Revimid (now renamed Revlimid). He had a horrible reaction to Revlimid including rash, diarrhea, fatigue, and he became incoherent. He was hospitalized for three days in August 2006, and when released, he was told to take the Revlimid again. He had completely stopped taking Poly-MVA despite his wife’s urging him to do so. He did not regain his full brain function and also underwent some personality change and became short-tempered. Shortly after, he was hospitalized with the same symptoms and released four days later. He was
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given oral pain medications to manage his bone pain. He was later switched to a pain patch. He started to decline rapidly and received home hospice care and intravenous morphine. Early November 2006, he got up to go to the bathroom and fell and cracked his ribs. He died shortly thereafter on November 9, 2006. By following an integrative treatment plan, he was able to exceed the 90-day lifespan that his oncologist predicted when he was first diagnosed in March 2001 with an excellent quality of life until shortly before his death. His wife expressed gratitude for the excellent quality of life KW had for six years after being told he had three months to live.

Discussion

These cases demonstrate a dramatic response to therapy with Poly-MVA, when conventional treatment was given for palliative care or in an attempt to slow the progression of disease. None of these patients were expected to achieve clinical remission or long-term stable disease. NSCLC and glioblastoma are generally diagnosed at stage 4, reducing the likelihood that conventional treatment will achieve any meaningful benefit. Although some of these interventions may slow the progression of disease or improve disease-free survival, the bottom line is that none of the conventional therapies used in the treatment of these cases extend overall survival for these deadly forms of cancer. There are many questions that still need to be answered with respect to Poly-MVA. These questions include the following:

1. What is the optimal dose?
2. Is the optimal dose determined by the type of cancer or the biological terrain of the patient (or both)?
3. How long should a patient stay on an optimal/therapeutic dose?
4. When and if a patient should consider cutting down on the dose? (In the case of KW, lowering the dose had dire consequences.)

5. In which type of cancer or treatments should the use of Poly-MVA be considered for optimal results?
6. If a patient fails conventional treatment, is Poly-MVA best used alone or adjuvant to further conventional treatment?
7. Can the use of Poly-MVA alone or adjuvant to further conventional treatment be determined to optimize results?
8. What types of cancer are least likely to respond to Poly-MVA?

The goal of the ongoing collection of case studies is to answer these and other pressing questions. As more cases are collected, this will hopefully pave the way for a meaningful large-scale study that can be conducted on our shores.

Dr. Lieberman earned her PhD in Clinical Nutrition and Exercise Physiology from The Union Institute, Cincinnati, Ohio and her MS degree in Nutrition, Food Science, and Dietetics from New York University. She is a Certified Nutrition Specialist (CNS); a Fellow of the American College of Nutrition (FACN); a member of the American Academy of Anti-Aging Medicine (A4M); a former officer, present board member and chair of the exam committee for the Certification Board for Nutrition Specialists; and immediate past President of the American Association for Health Freedom. She is the recipient of the National Nutritional Foods Association 2003 Clinician of the Year Award and is in the Cambridge Who's Who Registry of Executives and Professionals. Her newest books – The Gluten Connection (Rodale 2007) and Transitions Glycemic Index Food Guide (Square 1 Publishers 2006) were just recently released. Dr. Lieberman's best-selling book The Real Vitamin & Mineral Book is now in its 4th Edition (Avery/Penguin Putnam, 2007). She is the author of The Mineral Miracle (Square 1 Publishers 2006), User's Guide To Brain-Boosting Supplements (Basic Health Publications, Inc., 2004), Dare To Lose: 4 Simple Steps to a Better Body (Avery/Penguin Putnam, 2003); Get Off The Menopause Roller Coaster (Avery/Penguin Putnam, 2002); Maitake Mushroom and D-fraction (Woodland Publishing, 2001; Maitake King of Mushrooms (Keats Publishing 1997); and All About Vitamin C (Avery Publishing Group, 1999).

Dr. Lieberman is the Founding Dean of New York Chiropractic College's MS Degree in Clinical Nutrition; an industry consultant; a contributing editor to the American Medical Association's 5th Edition of Drug Evaluations; a peer reviewer for scientific publications; a published scientific researcher and a presenter at numerous scientific conferences. Dr. Lieberman is a frequent guest on television and radio, and her name is often seen in magazines as an authority on nutrition. She has been in private practice as a clinical nutritionist for more than 20 years.