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ARTICLE

Levo-Alpha Acetyl Methadol (LAAM)

Its Advantages and Drawbacks

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Abstract—*Levo-Alpha Acetyl Methadol, or LAAM, is a medication therapy for individuals addicted to opiates that provides an alternative to methadone. Because it is administered only three times a week and, therefore, requires fewer clinic trips, patient acceptance can be higher than with methadone. While blocking the effects of other opiates and preventing withdrawal, LAAM does not produce a subjective high. However, because most patients are not familiar with LAAM, they may be initially more anxious and need more counseling and support when receiving the medication than they would with the more familiar methadone medication. On balance, LAAM enables clinic administrators and counselors to offer an alternative medication to methadone that some clients prefer once they become adjusted to it because of LAAM's even, stable effect. Through hypothetical but true-to-life case studies of LAAM use, it is possible to gain a clearer understanding of the advantages and drawbacks of using LAAM.* © *1997 Elsevier Science Inc.*

Keywords—LAAM; pharmacotherapy; methadone.

INTRODUCTION

IN 1993, THE FOOD and Drug Administration (FDA) approved Levo-Alpha Acetyl Methadol (LAAM) for use in medication therapy for opiate addiction. LAAM, a derivative of methadone, was first developed in 1948 by German chemists as a pain killer (analgesic). As early as 1952, researchers found that LAAM could prevent opiate withdrawal symptoms for more than 72 hours. Interest in LAAM as a substitute for maintenance on methadone increased in the late 1960s. Between 1969 and 1981, 27 separate clinical trials involving over 6,000 patients were conducted. During the 1980s, limited LAAM research was conducted, primarily because of lack of funding. Then, in 1990, the National Institute on Drug Abuse (NIDA) initiated the process of seeking FDA approval of LAAM for maintenance therapy with opiate addicts in conjunction with additional studies to further evaluate

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the medication's safety and efficacy. Taken together, the entire body of LAAM research showed that the medication is as effective as, or more effective than, methadone in maintaining abstinence among opiate addicts (Blaine, Renault, Thomas, & Whysner, 1981; Center for Substance Abuse Treatment, 1995; Fraser & Isbell, 1952; Judson & Goldstein, 1979; Judson, Goldstein, & Inturrisi, 1983; Ling, Blakis, Holmes, Klett, & Carter, 1980; Ling, Charuvastra, Kaim, & Klett, 1976; Ling, Klett, & Gillis, 1978; Whysner & Levine, 1978; Zaks, Fink, & Freedman, 1972).

The approval of LAAM has meant that, for the first time, addiction treatment facilities can offer opiate-addicted patients a choice of either methadone or LAAM therapy. LAAM is sufficiently different from methadone that it can benefit some patients who have not been helped with methadone. While LAAM will not be the treatment of choice for everyone, clinicians can increase their successful treatment rates by identifying patients who may benefit most from LAAM's advantages.

LAAM, like methadone, is administered orally in juice, but, unlike methadone, it is given only every other day or three times a week rather than daily. Patients who switch from methadone to LAAM take from 1.2 to 1.3 times as much LAAM as methadone. Patients who have not been taking methadone start with a low dose and receive dosage increments of 5 to 10 mg until a dose in the therapeutic range is achieved—usually within 2 weeks. Federal regulations prescribe specific dosage requirements for new patients, for stabilized methadone maintenance patients, and for LAAM-maintained patients. These dosage requirements are listed in the product labeling.

LAAM and methadone vary in action because of differences in the way the body metabolizes them. The two most noticeable clinical differences in the two drugs are that there is a delay before the effects of LAAM can be detected and that LAAM remains much longer in the body than methadone—up to 72 hours for most people, at doses of 80 mg or above. The benefit of the slow elimination of LAAM is the production of a long, stable plateau during which withdrawal symptoms are prevented and the effects of other opiates are blocked. Table 1 compares the principal characteristics of LAAM and methadone.

This article reviews the clinical and administrative benefits and drawbacks of using LAAM. The article then presents three case studies of LAAM use that, while hypothetical, reflect true-to-life client, counselor, and program administrator perceptions of using LAAM. The information is based on a review of the literature on LAAM; staff interviews and focus groups with patients with experience with LAAM; and a review of training materials designed for staff, patient, and family orientation in the use of LAAM.

Pharmacology

LAAM creates a pharmacologic cross-tolerance to other opioids and therefore blocks the euphoric effects of those drugs while also controlling opiate craving. The clinical utility of LAAM is based primarily on the activity of two metabolites, rather than on that of the parent-drug alone. In the body, LAAM, metabolized by the liver, changes sequentially to nor-LAAM and dinor-LAAM. The combined duration of activity of all three of these compounds accounts for LAAM's long-acting properties (Center for Substance Abuse Treatment [CSAT], 1995).

Advantages and Disadvantages

There are several advantages to offering LAAM:

- LAAM can reduce the number of clinic visits for patients who have commuting difficulties, without making it necessary to provide take-homes that might be consumed accidentally by children or other persons in the home. As a result, LAAM frees patients from daily dependence on the clinic.
- LAAM promotes a more normal, even feeling state than methadone or heroin—LAAM does not produce the euphoric feeling associated with taking an opiate—while still blocking the effects of opiates and preventing withdrawal.
- LAAM provides an alternative for patients who want a change but are not ready for complete detoxification.
- Because federal regulations prohibit take-homes with LAAM, clinics avoid negotiating with patients over this privilege. (However, federal regulations permit any LAAM patient who would be eligible for take-home methadone, and who cannot visit the clinic for a regularly scheduled LAAM dose (e.g., because of vacation, illness), to be given methadone temporarily to take home.)
- LAAM reduces opportunities for diversion, since there are no take-homes.

While treatment with LAAM offers advantages, the following disadvantages have been observed:

- LAAM can be difficult for some patients to adjust to, although adjustment has improved with the current practice of using a more rapid induction schedule. It can take about 2 weeks for patients to reach steady-state and to become comfortable, although even low doses of LAAM will prevent most withdrawal symptoms during induction.
- LAAM should never be administered more often than every other day. If LAAM is given more frequently than every other day, doses will cumulate and a lethal overdose can result.
- Because LAAM does not require patients to come to the clinic every day to receive their medication, the lack of daily contact may be counterproductive for some patients who need daily contact with their counselors.
- Because most patients are not familiar with LAAM, they may be initially more anxious and need more

counseling and support when receiving the medication than they would with the better known methadone medication.

- Not everyone can take LAAM. Federal regulations prohibit giving LAAM to patients under the age of 18 and do not permit using LAAM with pregnant or nursing women except by written order of a physician who determines this to be the best therapy for them.

There are also some administrative tasks associated with offering LAAM. Every change in the dosage of LAAM must be accompanied by the written order of a physician. Women of childbearing potential must have a pregnancy test before starting on LAAM and monthly thereafter. Clinics must advise patients of childbearing age of the risks of LAAM and make a medical evaluation available to all patients who become pregnant while taking the medication. LAAM patients who become pregnant should be switched immediately to methadone.

The Need for Patient Education and Support

Patient education is and will continue to be a necessary part of offering LAAM until LAAM becomes a familiar treatment to clients. Patients, as well as their families, need to know what LAAM is, how to take it, how it differs from methadone, and what its relative advantages and disadvantages are. Patients also need to know what to expect, so that if they experience initial anxiety and discomfort, they know that these reactions are normal and that there are methods of minimizing them. Patients need to know that they risk overdose if they abuse street drugs or take other opiates while they are taking LAAM. Counselors must be actively involved in patient education and support. They must use their own knowledge about the medication to provide information about LAAM and to answer patient questions when they arise. An informed and supportive counseling staff can make a difference in how successfully patients stabilize on LAAM.

There are a number of educational materials for teaching patients and their families about LAAM. A video entitled *LAAM: Another Treatment Option for Opiate Addiction*, available through the National Clearinghouse for Alcohol and Drug Information (NCADI—call 1-800-729-6686), allows prospective or new patients to see and hear other opiate-addicted patients who are being treated with LAAM. The Treatment Improvement Protocol (TIPS) on LAAM, called *LAAM in the Treatment of Opiate Addiction*— also available from NCADI—provides a source of clinical information for both patients and staff.

CASE VIGNETTES

The following three case vignettes involving a patient, a counselor, and a program administrator are hypothetical. Although hypothetical, the vignettes are based in fact

TABLE 1
Comparison of the Principal Characteristics of LAAM and Methadone

Characteristics	LAAM	Methadone
Dosing	Every other day	Every day
Ingestion	Taken orally, mixed in juice	Taken orally, mixed in juice
Take-homes	None permitted	Permitted according to state and clinic policy
Detectable Effects	Delayed detectable effect—less detectable opiate effect ("high")	Early detectable opiate effect ("high")
Cumulative Toxicity	LAAM stays in the body for a long time; danger of overdose when illicit drugs are used due to cumulative toxicity	Danger of overdose is shorter in duration; not the same risk of cumulative toxicity
Metabolism Pattern	Produces a long, even plateau in the level of drug in the body once steady-state is reached	Drug more rapidly metabolized, less risk of cumulative toxicity, some clients will notice highs and lows
Treatment Induction	Treatment induction period may last approximately 2 weeks; clients may require additional counseling until steady state is reached	Treatment induction shorter; some counseling needed during transition period
Client Familiarity	Clients may be anxious about taking an unfamiliar medication	Most clients are familiar with methadone
Effectiveness	LAAM was seen to be at least as effective as methadone (and sometimes better) as judged by negative urine tests for opiate use	Urine test for illicit drugs show that methadone is effective for many, though not all, clients
Safety	LAAM similar to methadone in safety when used as directed	Safe when used as directed

and have been reviewed for realism by staff working in clinics where LAAM is offered.

Patient Vignette

Roberta Smith entered Payson Park methadone program last year. She had been in the program 4 years ago but had dropped out after 2 years. She decided to come back after resuming opiate use. Smith was told by her counselor about a drug called LAAM that she could take as an alternative to methadone. Her counselor explained that with LAAM she would only have to come to the clinic three times a week instead of every day. Due to clinic policy, the physician recommended that she go on methadone for 30 days and then cross over to LAAM. The other option would have been to start taking LAAM right away.

The treatment plan sounded good to her, but she had heard some other patients complaining about LAAM, saying it was not all that great. "Sure," one of them said, "you don't have to come into the program every day, but LAAM makes you feel restless, and it's tough getting through the weekend."

Smith asked her counselor some questions about LAAM and was glad to learn he was well informed about it. He was enthusiastic about her trying it because she was motivated to stay clean—Smith had a job and two children. His enthusiasm seemed real to her, not fake or overdone. Her counselor told her frankly that LAAM does not work for every patient, explaining that it is not a "magic bullet" that cures everyone. He also said that she would have to get tested to see if she were pregnant and then continue to get tested every month while taking LAAM. Smith agreed to this.

Her counselor also warned that she could be uncomfortable until they worked out her appropriate dosage, and that this discomfort could last up to 2 weeks. He said if she did not like LAAM, she could switch back to methadone at any time.

Smith especially liked the fact that people would not instantly recognize LAAM as a medication for opiate addiction, and that, as a result, she would feel less ashamed when people found out she was taking it. She agreed to give it a try.

After a month on methadone, Roberta's counselor arranged the switchover. There was no need to taper off methadone and get increasing doses of LAAM. One day she was taking methadone, and the next day she was taking LAAM.

For the first week or so, her experience was not very good; Smith almost switched back to methadone. At first, she felt somewhat hyperactive on the days she got dosed with LAAM, and then the next day she was tired. She had a few hot flashes, and she had trouble sleeping.

Smith stuck it out, and eventually most of the problems went away. She still sometimes feels that LAAM does not hold as well on the second day, but, as she says, "It's nothing I can't handle."

Recently, Smith had to go out of town for 4 days to her brother's wedding, and she was frightened about what would happen to her without LAAM. Her counselor told her not to worry and gave her take-home methadone to tide her over the long weekend, explaining that she could just go right on taking LAAM when she got back. Smith was still nervous about switching back and forth, but it turned out to be easy. She says she will not worry the next time she needs to go away for a few days.

Smith says she feels more like a normal human being not having to go in for medication every day—now there are 4 days a week when she can forget that she is an opiate-addicted person. She no longer has the ups and downs she used to get when she was on methadone.

Counselor Vignette

Last year, the medical director of the Schubert clinic met with all the counselors and explained that patients were going to be offered the options of taking LAAM or methadone. Jennifer Bennett, one of the counselors who had been around the longest, wondered at first why another medication was needed to complicate their lives. "After all," she thought, "these experimental drugs never seem to work."

However, the medical director explained that for some patients LAAM had advantages compared to methadone and that LAAM was not that hard to administer. Bennett also realized that she would not have to negotiate with the LAAM patients over whether to give them take-homes.

She felt better when the medical director made it clear that they should be completely honest about LAAM and not raise any false hopes about the drug. Counselors could warn each patient that LAAM does not work for everyone. Best of all, they could tell patients they could switch back to methadone anytime they wanted.

Bennett still had serious doubts that LAAM was a good thing and felt that most patients would not be interested in switching. She asked the medical director to indicate what kinds of patients were most likely to do well on LAAM—young patients, older patients, men, women, and so on—but he said there was no profile of the best patient for LAAM. That meant that counselors would not be able to predict accurately which patients would benefit from LAAM.

The director did point out that LAAM would probably work best for methadone patients who want to travel to the clinic less often because they had day-time jobs or lived far away, as well as for patients who were not eligible for take-home methadone. They also agreed they should encourage patients suspected of double dosing on their weekend methadone take-homes to switch to LAAM.

It turned out that the problems Bennett had with LAAM were not those she had expected. Initially, she found that she had to spend more time with LAAM patients because they were so concerned about whether the drug would hold them over the weekend. She also had to

reassure patients who said they got no effect at all from LAAM that the drug was still working. She had to keep telling some of them that LAAM would block the effects of heroin even though it was not making them feel high or sedated. During the early days, her patients needed a lot of reassurance whenever things were not going smoothly, since they tended to blame anything that seemed unusual on LAAM.

Bennett learned, though, that these problems generally went away after patients had been on LAAM a few weeks. By then, their correct dose had been figured out and they were more comfortable with the new medication.

Bennett has come to feel comfortable with LAAM, even though some patients do quit taking it and go back to methadone. But some of the patients that remain on LAAM seem to use other drugs, like heroin, less often than the methadone patients. Bennett is happy that there is an alternative to methadone to offer patients, and in some cases it seems to work better.

Program Administrator Vignette

The Westside Clinic started using LAAM 2 years ago. Because only a small percentage of its patients are on LAAM, Mark Williams, the program administrator, reports that changes in staff jobs and in the overall treatment environment have been minor.

One thing that he says has changed is the amount of patient education that is needed. First, intake counselors have to describe LAAM to new patients and tell them that this is a treatment option for opiate-addicted persons. Then the counselors have to explain the potential benefits and disadvantages of using LAAM.

Before the clinic could adopt these changes, Williams says, *the counselors* had to be educated about LAAM, which took some time. In the beginning, some of the staff had negative attitudes about using LAAM. A few of them indicated they did not think it was as good as methadone, and there was some fear that LAAM would increase their workload. It was difficult for the clinic administration initially to get intake staff to discuss LAAM as an option with patients. They found it was hard to break old habits. Even now, Williams says that some intake counselors feel better about LAAM than others: the clinic's records show that patients who see two of the program's intake counselors have much better records of sticking with LAAM than patients who see the third intake worker. He speculates that the successful counselors may have more positive attitude toward LAAM.

Williams says that educating the counselors has helped improve their attitude toward LAAM, but the real change came when they saw positive results with some of their patients.

The clinic administration found that dispensary staff and counselors also had to be trained to be able to respond to LAAM patients in a problem resolution mode. Adding a new medication tested the program's operations and morale because patients feel nervous about starting a new medication.

Williams found that offering LAAM did change the workload of the medical director. He had to be available more often—7 days a week—and available immediately, at least by phone, to handle dosing problems and provide patients who were just starting on LAAM with extra reassurance and encouragement. But once a patient is stabilized on LAAM, Williams says this extra support is rarely needed.

To simplify decision-making for staff, the clinic developed protocols for when and how much to increase doses, and for what to do when patients felt they could not make it through the weekend, missed a scheduled dose, or needed to go away for more than 2 days at a time. "For example," Williams says, "it was decided that when a patient misses a dose and comes in the next day, the physician will give the regular LAAM dose that day, follow an every-other-day schedule for the rest of the week, and resume the normal schedule on the following week."

Every time a new patient switches to LAAM, the physician has to do some fine tuning to figure out the right dose of the new drug. However, this involves no more work than when the right methadone dose has to be figured out for a new patient. The clinic physician says he also has to take the time and have the patience to provide reassurance—explain why it takes a while for LAAM to take effect; explain that a side effect a patient may be having is not due to LAAM, is not harmful, or will go away; remind patients that LAAM has been used since the 1940s with no known long-term damage; and so on.

LAAM at first placed some extra administrative requirements on the clinic, but Williams says they were not onerous. Once the necessary changes were made, there was little extra work involved. According to Williams, one of the permanent changes was that dispensary staff have to pay extra attention to storing a second medication; there are now two medications, both liquid and with similar dosage ranges, to keep separate. Also, the nurses must be on their toes to separate the two patient groups—those getting methadone and those getting LAAM. But this is not really a problem: the patients' charts are clearly marked, there are separate medication logs for LAAM and methadone patients, and LAAM patients do not show up on the computer for methadone patients.

The clinic does have a temporary problem when one of the dispensing staff leaves, because the new person (who usually has never dealt with LAAM before) has to be trained in both dispensing protocols. Since its staff turnover is low, this is not a difficult problem.

Clinic staff tell Williams that even planned interruptions in the LAAM dispensing schedule (such as when a patient goes on vacation) are not a problem. They just follow the procedures that have been developed for calculating the correct amount of methadone to be given after the last dose of LAAM.

"Overall," he says, "there's been no change in the workload of the dispensary staff or counseling staff, but that could be because less than 10 percent of our patients are on LAAM." If the clinic's proportion of LAAM patients increases, he believes it is possible that staff dispensing time might be reduced because the medication would need to be given out only three times, not seven times, a week. He says that testing the female patients for pregnancy has not proven to be any extra work, either. The clinic splits the urine sample the patient provides for drug testing and uses half for pregnancy testing.

One problem Williams had identified is that using LAAM causes some frustration because some patients cannot afford it. LAAM costs slightly more each week than methadone does. While the amount per week is small, it can add up over the year. Some of the clinic's patients have gone back onto methadone because they found that LAAM proved to be too expensive.

"This is a fee-for-service program, so patients have to pay for medications, whether through insurance or on their own," says Williams. Other administrators have told him that even some of their funded programs have limited money and are not able to provide LAAM to as many patients as they would like. Williams' clinic is thinking of absorbing the extra cost of LAAM just so it can offer it to more patients and keep opiate-addicted patients who are successful on LAAM from having to give it up for financial reasons.

Using LAAM has resulted in some positive changes for this program, according to Williams. There has been a slight reduction in traffic flow in the lobby, and staff members feel there is sure to be even less crowding if more patients start using LAAM. Counselors have told him that some LAAM patients are less concerned, and create less of a hassle, about the dose they are receiving than when they were on methadone because they cannot get a high or a feeling of sedation from LAAM by manipulating the dose.

Perhaps the best result of using LAAM that Williams has seen is that most of the staff now feel they have an option they can present to patients—"It's no longer a take it or leave it choice with methadone," he says. The urines of most opiate-addicted patients who have been stabilized on LAAM for some time seem to test positive less often for other drugs than when they were on methadone. Once they get stabilized on LAAM, some of them experience a real improvement in quality of life in terms of work performance, family life, and other types of prosocial behavior.

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