

# Study Links Four Anticonvulsants to Suicide Risk

BY MARY ANN MOON

The link between anticonvulsant agents and suicidal acts or violent death—first revealed in a Food and Drug Administration meta-analysis in 2008—appears to have been confirmed for four of the drugs: gabapentin, lamotrigine, oxcarbazepine, and tiagabine, according to a new report.

In what investigators described as the

first study to directly compare suicide risks with different anticonvulsants given in routine care, “increased risk for suicidal acts beginning within the first 14 days of treatment initiation” was found, reported Dr. Elisabetta Patorno of Brigham and Women’s Hospital, Boston, and her associates. This finding opens the possibility that anticonvulsants “could induce [adverse] behavioral effects prior to the achievement of their full

therapeutic effectiveness,” they wrote.

The investigators noted that in the FDA meta-analysis, the number of events was small and largely confined to cases of suicidal ideation only. This “prevented definitive conclusions about the safety of individual agents.”

In addition, in many of the studies included in the meta-analysis, the anticonvulsant agents were used as adjunctive treatment, “further complicating

the assessment of their individual effect.

“Thus, the FDA meta-analysis could not provide patients or clinicians with clear guidelines on risk for specific agents or patient subgroups,” Dr. Patorno and her colleagues noted.

They addressed these issues by conducting a cohort study using a data from 297,620 new prescriptions for anticonvulsant drugs in 17 states between 2001 and 2006. The risks of attempted or completed suicidal acts or violent deaths were compared between patients aged 15 and older who had initiated treatment with one of two reference anticonvulsants (topiramate or carbamazepine) and patients who had initiated treatment with any of 13 other anticonvulsants.

The study subjects were to be followed for 180 days or until they discontinued or switched medications, had a study outcome, or discontinued the study for other reasons. Mean follow-up turned out to be 91 days.

There were 801 attempted suicides, 26 completed suicides, and 41 violent deaths within 180 days of initiating anticonvulsant therapy. Compared with subjects initiating use of topiramate or carbamazepine, those starting on gabapentin, lamotrigine, oxcarbazepine, and tiagabine were at significantly increased risk for these events, the investigators said (JAMA 2010;303:1401-9).

A further analysis of the data showed that new users of gabapentin had an excess of 5.6 cases of attempted or completed suicide per 1,000 person-years, new users of oxcarbazepine had an excess of 10 cases per 1,000 person-years, and new users of tiagabine had an excess of 14.1 cases per 1,000 person-years, compared with new users of topiramate.

“These findings are compatible with the results of the FDA meta-analysis, which found similarly increased risks of suicidal behavior or ideation for all anticonvulsant drugs compared with placebo,” Dr. Patorno and her associates said.

They cautioned that their study was exploratory in nature, and so could only suggest rather than definitively establish a causal relationship between these drugs and suicidal behavior. “There is no clear understanding of a possible mechanism of action that could lead to suicidal behavior in patients taking these medications,” the researchers added.

Gabapentin and lamotrigine have been linked to behavioral problems such as aggression and hyperactivity, particularly in children and adults who have learning disabilities or cognitive impairment. Tiagabine has been reported to cause nervousness and depressive mood in some patients. And oxcarbazepine is thought to have a stimulant effect on psychomotor functioning in some, they said. ■

**Disclosures:** This study was funded by the HealthCore Fellowship in Pharmacoepidemiology and the Pharmacoepidemiology Research and Training Fund of the Harvard School of Public Health. Dr. Patorno reported no financial conflicts of interest.



## LIDODERM® (Lidocaine Patch 5%)

**Brief Summary** (For full Prescribing Information refer to package insert.)

### INDICATIONS AND USAGE

LIDODERM is indicated for relief of pain associated with post-herpetic neuralgia. It should be applied only to **intact skin**.

### CONTRAINDICATIONS

LIDODERM is contraindicated in patients with a known history of sensitivity to local anesthetics of the amide type, or to any other component of the product.

### WARNINGS

#### Accidental Exposure in Children

Even a *used* LIDODERM patch contains a large amount of lidocaine (at least 665 mg). The potential exists for a small child or a pet to suffer serious adverse effects from chewing or ingesting a new or used LIDODERM patch, although the risk with this formulation has not been evaluated. It is important for patients to **store and dispose of LIDODERM out of the reach of children, pets, and others.** (See HANDLING AND DISPOSAL)

#### Excessive Dosing

Excessive dosing by applying LIDODERM to larger areas or for longer than the recommended wearing time could result in increased absorption of lidocaine and high blood concentrations, leading to serious adverse effects (see ADVERSE REACTIONS, Systemic Reactions). Lidocaine toxicity could be expected at lidocaine blood concentrations above 5 µg/mL. The blood concentration of lidocaine is determined by the rate of systemic absorption and elimination. Longer duration of application, application of more than the recommended number of patches, smaller patients, or impaired elimination may all contribute to increasing the blood concentration of lidocaine. With recommended dosing of LIDODERM, the average peak blood concentration is about 0.13 µg/mL, but concentrations higher than 0.25 µg/mL have been observed in some individuals.

### PRECAUTIONS

#### General

**Hepatic Disease:** Patients with severe hepatic disease are at greater risk of developing toxic blood concentrations of lidocaine, because of their inability to metabolize lidocaine normally.

**Allergic Reactions:** Patients allergic to para aminobenzoic acid derivatives (procaine, tetracaine, benzocaine, etc.) have not shown cross sensitivity to lidocaine. However, LIDODERM should be used with caution in patients with a history of drug sensitivities, especially if the etiologic agent is uncertain.

**Non-intact Skin:** Application to broken or inflamed skin, although not tested, may result in higher blood concentrations of lidocaine from increased absorption. LIDODERM is only recommended for use on intact skin.

**External Heat Sources:** Placement of external heat sources, such as heating pads or electric blankets, over LIDODERM patches is not recommended as this has not been evaluated and may increase plasma lidocaine levels.

**Eye Exposure:** The contact of LIDODERM with eyes, although not studied, should be avoided based on the findings of severe eye irritation with the use of similar products in animals. If eye contact occurs, immediately wash out the eye with water or saline and protect the eye until sensation returns.

#### Drug Interactions

**Antiarrhythmic Drugs:** LIDODERM should be used with caution in patients receiving Class I antiarrhythmic drugs (such as tocainide and mexiletine) since the toxic effects are additive and potentially synergistic.

**Local Anesthetics:** When LIDODERM is used concomitantly with other products containing local anesthetic agents, the amount absorbed from all formulations must be considered.

#### Carcinogenesis, Mutagenesis, Impairment of Fertility

**Carcinogenesis:** A minor metabolite, 2, 6-xyldine, has been found to be carcinogenic in rats. The blood concentration of this metabolite is negligible following application of LIDODERM.

**Mutagenesis:** Lidocaine HCl is not mutagenic in Salmonella/mammalian microsome test nor clastogenic in chromosome aberration assay with human lymphocytes and mouse micronucleus test.

**Impairment of Fertility:** The effect of LIDODERM on fertility has not been studied.

#### Pregnancy

**Teratogenic Effects: Pregnancy Category B.** LIDODERM (lidocaine patch 5%) has not been studied in pregnancy. Reproduction studies with lidocaine have been performed in rats at doses up to 30 mg/kg subcutaneously and have revealed no evidence of harm to the fetus due to lidocaine. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, LIDODERM should be used during pregnancy only if clearly needed.

#### Labor and Delivery

LIDODERM has not been studied in labor and delivery. Lidocaine is not contraindicated in labor and delivery. Should LIDODERM be used concomitantly with other products containing lidocaine, total doses contributed by all formulations must be considered.

#### Nursing Mothers

LIDODERM has not been studied in nursing mothers. Lidocaine is excreted in human milk, and the milk: plasma ratio of lidocaine is 0.4. Caution should be exercised when LIDODERM is administered to a nursing woman.

#### Pediatric Use

Safety and effectiveness in pediatric patients have not been established.

### ADVERSE REACTIONS

#### Application Site Reactions

During or immediately after treatment with LIDODERM (lidocaine patch 5%), the skin at the site of application may develop blisters, bruising, burning sensation, depigmentation, dermatitis, discoloration, edema, erythema, exfoliation, irritation, papules, petechia, pruritus, vesicles, or may be the locus of abnormal sensation. These reactions are generally mild and transient, resolving spontaneously within a few minutes to hours.

#### Allergic Reactions

Allergic and anaphylactoid reactions associated with lidocaine, although rare, can occur. They are characterized by angioedema, bronchospasm, dermatitis, dyspnea, hypersensitivity, laryngospasm, pruritus, shock, and urticaria. If they occur, they should be managed by conventional means. The detection of sensitivity by skin testing is of doubtful value.

#### Other Adverse Events

Due to the nature and limitation of spontaneous reports in postmarketing surveillance, causality has not been established for additional reported adverse events including:

Asthenia, confusion, disorientation, dizziness, headache, hyperesthesia, hypoesthesia, lightheadedness, metallic taste, nausea, nervousness, pain exacerbated, paresthesia, somnolence, taste alteration, vomiting, visual disturbances such as blurred vision, flushing, tinnitus, and tremor.

#### Systemic (Dose-Related) Reactions

Systemic adverse reactions following appropriate use of LIDODERM are unlikely, due to the small dose absorbed (see CLINICAL PHARMACOLOGY, Pharmacokinetics). Systemic adverse effects of lidocaine are similar in nature to those observed with other amide local anesthetic agents, including CNS excitation and/or depression (light-headedness, nervousness, apprehension, euphoria, confusion, dizziness, drowsiness, tinnitus, blurred or double vision, vomiting, sensations of heat, cold, or numbness, twitching, tremors, convulsions, unconsciousness, respiratory depression, and arrest). Excitatory CNS reactions may be brief or not occur at all, in which case the first manifestation may be drowsiness merging into unconsciousness. Cardiovascular manifestations may include bradycardia, hypotension, and cardiovascular collapse leading to arrest.

#### OVERDOSAGE

Lidocaine overdose from cutaneous absorption is rare, but could occur. If there is any suspicion of lidocaine overdose (see ADVERSE REACTIONS, Systemic Reactions), drug blood concentration should be checked. The management of overdose includes close monitoring, supportive care, and symptomatic treatment. Dialysis is of negligible value in the treatment of acute overdose with lidocaine.

In the absence of massive topical overdose or oral ingestion, evaluation of symptoms of toxicity should include consideration of other etiologies for the clinical effects, or overdosage from other sources of lidocaine or other local anesthetics.

The oral LD<sub>50</sub> of lidocaine HCl is 459 (346-773) mg/kg (as the salt) in non-fasted female rats and 214 (159-324) mg/kg (as the salt) in fasted female rats, which are equivalent to roughly 4000 mg and 2000 mg, respectively, in a 60 to 70 kg man based on the equivalent surface area dosage conversion factors between species.

#### DOSAGE AND ADMINISTRATION

Apply LIDODERM to intact skin to cover the most painful area. Apply up to three patches, only once for up to 12 hours within a 24-hour period. Patches may be cut into smaller sizes with scissors prior to removal of the release liner. (See HANDLING AND DISPOSAL) Clothing may be worn over the area of application. Smaller areas of treatment are recommended in a debilitated patient, or a patient with impaired elimination.

If irritation or a burning sensation occurs during application, remove the patch (es) and do not reapply until the irritation subsides.

When LIDODERM is used concomitantly with other products containing local anesthetic agents, the amount absorbed from all formulations must be considered.

#### HANDLING AND DISPOSAL

Hands should be washed after the handling of LIDODERM, and eye contact with LIDODERM should be avoided. Do not store patch outside the sealed envelope. Apply immediately after removal from the protective envelope. Fold used patches so that the adhesive side sticks to itself and safely discard used patches or pieces of cut patches where children and pets cannot get to them. LIDODERM should be kept out of the reach of children.

Store at 25°C (77°F); excursions permitted to 15°-30°C (59°-86°F). [See USP Controlled Room Temperature].

Manufactured for:

Endo Pharmaceuticals Inc.

Chadds Ford, Pennsylvania 19317



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