Simple Conversion from Intravenous Aminophylline to Twice Daily Oral Theophylline

To the Editor:

We would like to share a simple method to calculate the dose of oral sustained-release theophylline when converting from intravenous aminophylline therapy. In most adult patients receiving intravenous aminophylline, a sustained-release theophylline product administered every 12 hours is selected when oral therapy is initiated. Typically, after steady-state is achieved with the intravenous aminophylline infusion, the following procedure is used to calculate the oral theophylline dose. Aminophylline infusion rate (mg/hour) is multiplied by 24 to yield total daily dose of aminophylline. This dose (mg/day) is then multiplied by 0.8—adjustment for the ethylendiamine component of aminophylline—to yield the total daily dose of theophylline. This dose is then divided by the daily frequency of oral theophylline administration.

A simplified approach for this conversion is to multiply the mg/hour of intravenous aminophylline that the patient is receiving by ten to yield the dose of sustained-release theophylline to be administered every 12 hours. This is explained by the following: the product of 24 and 0.8 yields 19.2, which can then be rounded-off to 20. When the dose is administered on a twice daily basis, every 12 hours, this value is then divided by 2 (20 divided by 2 = 10). For example, using the traditional approach with an aminophylline infusion rate of 30 mg/hour, the dose of sustained-release theophylline would be 288 mg every 12 hours [(30 × 24 × 0.8)/2], which is rounded-off to 300 mg every 12 hours. The simplified approach described above yields the same dose of 300 mg every 12 hours (30 × 10).

Various factors should be considered when using this simplified approach. First, in order for the theophylline serum concentrations achieved to closely approximate those of the constant aminophylline infusion, the patient must have received aminophylline sufficiently long to achieve steady-state. Second, because multiplication of the aminophylline infusion rate by ten may yield a dose of sustained-release theophylline that is not commercially available, it may be necessary to round-off the dose to the nearest available dosage formulation. Caution should be exercised when rounding-off the dose because of the potential nonlinear pharmacokinetic disposition of theophylline. Finally, after converting from intravenous to oral therapy, steady-state theophylline serum concentrations should be determined to document proper absorption. However, these same considerations apply when calculating the theophylline dose by the standard mathematic approach. This simplified approach is associated with a 4 percent error [(20 - 19.2)/20] × 100] when compared to the traditional method of calculating the oral theophylline dose from an aminophylline infusion. It is unlikely that this degree of error would result in any clinically significant differences.

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Primary Sjögren Syndrome and Pleural Effusion

To the Editor:

We read with interest the paper by Wallaert et al1 and would like to refer to a case that presented with pleural effusion and primary Sjögren syndrome (PSS). We have not found this association previously described in the literature. Cytologic findings in the bronchoalveolar lavage (BAL) fluid of this patient agree with those communicated by Wallaert et al in their article.

A 64-year-old woman was admitted for evaluation of a five-day history of thoracic pain and nonproductive cough. She denied dyspnea or fever. She had been diagnosed two years before of Sjögren and Raynaud syndrome. There was no history of previous trauma, recent surgery, bed-confinement, long journeys or cardiac insufficiency. She was on no medication. Physical examination revealed normal parotid glands, dry oral mucosa, a positive Schirmer test, several dental caries; ventilation was absent on both pulmonary bases. She had petechial lesions on the left thigh and on the posterocervical side of both feet. Complete blood count, urinalysis, blood biochemical studies and coagulation test results were normal, except for an erythrocyte sedimentation rate of 77 mm/h. Level of plasma proteins was 7.8 g/dl (albumin 47 percent, gammaglobulin 27 percent). Serum immunoglobulins were IgG 1850 mg/dl, IgA 430 mg/dl, and IgM 92 mg/dl. Rheumatoid factor was negative. Antinuclear antibodies and anti-SSB (La) were positive; anti-SSA (Ro), anti-RNP, anti-Sn, anti-DNA native were all negative. HLAB8 test was positive. Two serologic specimens tested for Mycoplasma pneumoniae, Coxiella burnetti, Chlamydia psittaci, Legionella pneumophila and respiratory viruses were negative. Tuberculin (PPD-R723) cutaneous test result was negative. ECG appeared normal. Chest x-ray film demonstrated bilateral pleural effusion, greater on the left side.

Pulmonary function test revealed mild small-airway disease; lip-mucosa biopsy proved a lymphohctary infiltrate of accessory salivary glands. Pleural effusion showed lymphocytic exudate with normal pH and glucose level; LE cells and rheumatoid factor tests were negative; cultures for aerobic, anaerobic, fungi and Löwenstein were also negative. Fluid cytology revealed no malignant cells. Three pleural biopses (for reactive mesothelial hyperplasia and Löwenstein) were culture-negative. Bronchofibroscopy demonstrated an atrophic bronchial mucosa. BAL cytology revealed macrophages 73 percent, neutrophils 4 percent and lymphocytes 24 percent (T 65 percent and B 6 percent; ratio of T4/T8 1.4). Transtracheal biopsy gave no pathologic findings. Bacteriologic studies and cultures in Löwenstein were negative.

During her stay in the hospital, pleural effusion improved