Over-the-counter analgesic powder use in patients presenting with intracerebral hemorrhage
A case series

Syed Ali Raza, MD¹, Laura Beth Durm, RN², Ghada A. Mahmoud, MD, MSc³, Haseeb Rahman, MD⁴, Laura Henriquez, NP⁵, Brittaine Davis, PA⁶, Fadi Nahab, MD⁷

Abstract

Introduction: Over-the-counter (OTC) analgesics including aspirin-containing powder formulations (BC Powder, Goody’s Powder) (ACPFs) are commonly utilized in the United States. While the ACPF s have been associated with upper gastrointestinal bleeding, we describe a case series of patients presenting with intracerebral hemorrhage (ICH) within 24 hours of ingestion.

Methods: We reviewed all ICH patients presenting to a comprehensive stroke center from September 1, 2014 through June 30, 2016 to identify patients who reported taking BC Powder or Goody’s Powder within 7 days of their stroke. Baseline characteristics, medication use, stroke risk factors, clinical imaging, and laboratory testing were reviewed retrospectively.

Results: Of 334 patients admitted with ICH during the study period, 6 (2%) reported use of OTC analgesic powders within 1 week of their index stroke. All had consumed at least 1 packet within 24 hours of their ICH. All patients were African American and all except 1 patient were females. Three patients had no identified traditional stroke risk factors and 3 other patients had evidence of mild hypertension history.

Conclusions: Over-the-counter analgesic powders containing high doses of aspirin including BC Powder and Goody’s Powder may contribute to ICH in patients with no or minimal risk factors. Providers should inquire about the use of these powders in ICH patients particularly among African Americans.

Abbreviations: ACPF = aspirin-containing powder formulation, AVF = arteriovenous fistula, AVM = arteriovenous malformation, COX1 = cyclooxygenase-1, CTA = computed tomography angiography, ICH = intracerebral hemorrhage, MRA = magnetic resonance angiography, NANSAIDs = nonaspirin nonsteroidal antiinflammatory drugs, NSAIDs = nonsteroidal antiinflammatory drugs, OTC = over-the-counter, PG = prostaglandin.

Keywords: intracerebral hemorrhage (ICH), nonsteroidal antiinflammatory drugs (NSAIDs), over-the-counter (OTC)

1. Introduction

Over-the-counter (OTC) drugs are widely used in the United States. A prior study of medication use patterns in the United States found that more than 80% of American adults used at least 1 OTC or prescription drug each week.¹ The most frequently utilized medications include OTC analgesics with 17% to 23% of the population using these in the preceding week.² Chronic OTC analgesic use is also frequently used in the elderly population for pain relief.³,⁴

OTC analgesics commonly include acetaminophen, nonsteroidal antiinflammatory drugs (NSAIDs) including aspirin, ibuprofen, and naproxen- and powder formulations (BC Powder, Goody’s Powder). Adverse effects including increased upper gastrointestinal (GI) bleeding tendency is a commonly reported side effect of the use of NSAIDs.⁵ Cyclooxygenase (COX) inhibition by NSAIDs leading to interference with protective prostaglandins (PGs) contributes to upper GI bleeding.⁶ Aspirin and nonaspirin nonsteroidal antiinflammatory drugs (NANSAIDs) also affect systemic hemostasis by inhibiting platelet COX.⁷ Platelet COX-1 enables conversion of arachidonic acid into thromboxane A₂ which mediates platelet aggregation; inhibition of COX-1 thereby leads to increased bleeding time.⁸ Aspirin is an irreversible inhibitor while NANSAIDs reversibly inhibit COX-1 which lead to differential pharmacodynamics relevant to COX-1 blockade. Risks of bleeding with aspirin or NANSAIDs are enhanced with use of large doses, concomitant use of alcohol, anticoagulants or by presence of comorbidities like liver disease, renal failure, and coagulopathies.⁹ Hemorrhagic stroke has been associated with use of aspirin previously.⁰ This may be attributed to impaired primary hemostasis as a result of platelet inhibition when an imbalance between thromboxane and prostacyclin occurs.¹¹,¹² In this study, we evaluated the frequency of recent OTC analgesic powder use with BC Powder (Aspirin 845 mg, Caffeine 65 mg) and Goody’s Powder (Aspirin 320 mg, Acetaminophen...
260mg, Caffeine 32.5mg, Potassium 60mg) use in patients presenting with ICH.

2. Methods

In this case series, we retrospectively reviewed all ICH patients presenting to Emory University Hospital from September 1, 2014 through June 30, 2016 with documentation of BC Powder and Goody’s Powder use within 7 days of their index stroke. Hemorrhagic stroke was confirmed with noncontrast CT and patients underwent cardiac telemetric monitoring, serial neurological examinations, and brain imaging to evaluate for secondary causes of ICH including MRI brain with and without contrast, head magnetic resonance angiography (MRA) and/or computed tomography angiography (CTA); all brain imaging was interpreted by board certified neuroradiologists. Patients were excluded from the study if ICH was secondary to any or a combination of following causes: head trauma, excessive anticoagulation, aneurysms, arteriovenous malformation (AVM) or arteriovenous fistula (AVF), or recent illicit drug use. A nonsurgical strategy of acute blood pressure control in combination with avoidance of antithrombotic use was used to treat ICH patients.

Data were collected from patients’ electronic medical records including demographics, past medical history, secondary causes of bleeding if any, medication history, clinical evaluation, diagnostic testing including laboratory results, brain imaging, and cerebral vascular imaging. The study was approved by the Emory institutional review board.

3. Results

During the 22-month study period, 334 patients were admitted with ICH including 6 patients (2%) with documented use of OTC analgesic powders (BC Powder, Goody’s Powder) within 1 week of their index stroke. All patients had utilized at least 1 packet of the OTC analgesic powder within 24 hours of their stroke, all were African American, and 5 (83%) patients were female. Three patients had no identified traditional stroke risk factors and 3 other patients had mild hypertension with mild left ventricular hypertrophy identified on echocardiography (Table 1). ICH location was primarily in basal ganglia (67%) with one patient having hemorrhage in the cerebellum and one patient with hemorrhage in the occipital lobe. The most common indication for analgesic powder use were headaches and were being used for at least 7 days and up to 6 months before ICH presentation though brain imaging showed evidence of an acute ICH in all patients, suggesting that the use of analgesic powders had preceded the onset of ICH.

4. Discussion

We identified patients with ICH who had consumed OTC analgesic powders within 1 week of their index stroke and were found to have no secondary causes of bleeding, no prior history of illicit drug abuse and minimal or no stroke risk factors. Given that all patients had taken at least 1 powder packet daily for at least 1 week before presentation and that brain imaging showed evidence of an acute (rather than subacute) ICH further supports that analgesic powder was being used before the onset of the ICH and not after the ICH had already occurred. Our findings support 1 previous case report which associated BC Powder overdosing in a patient with ICH.[9]

Table 1

<table>
<thead>
<tr>
<th>Patient no.</th>
<th>Stroke type</th>
<th>Stroke location</th>
<th>Age</th>
<th>Sex</th>
<th>Race</th>
<th>Stroke risk factors</th>
<th>Powder type used</th>
<th>Powder amount</th>
<th>Last use of powder before stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (YW)</td>
<td>ICH</td>
<td>Basal ganglia</td>
<td>56</td>
<td>Female</td>
<td>African American</td>
<td>None</td>
<td>BC Powder</td>
<td>50 packets in 30 d</td>
<td>Within 24 h of the stroke</td>
</tr>
<tr>
<td>2 (NS)</td>
<td>ICH</td>
<td>Cerebellum</td>
<td>70</td>
<td>Female</td>
<td>African American</td>
<td>Diabetes (A1c 9.4), HTN, OSA</td>
<td>Goody Powder</td>
<td>Daily packet use for 14 d</td>
<td>Within 24 h of the stroke</td>
</tr>
<tr>
<td>3 (IB)</td>
<td>ICH</td>
<td>Basal ganglia</td>
<td>39</td>
<td>Female</td>
<td>African American</td>
<td>None</td>
<td>Goody Powder</td>
<td>Daily packet use for 15 d</td>
<td>Within 24 h of the stroke</td>
</tr>
<tr>
<td>4 (SA)</td>
<td>ICH</td>
<td>Basal ganglia</td>
<td>63</td>
<td>Male</td>
<td>African American</td>
<td>HTN, mild concentric LVH</td>
<td>BC Powder</td>
<td>Daily packet use for 1 wk</td>
<td>Within 24 h of the stroke</td>
</tr>
<tr>
<td>5 (JR)</td>
<td>ICH</td>
<td>Occipital lobe</td>
<td>45</td>
<td>Female</td>
<td>African American</td>
<td>None</td>
<td>BC Powder</td>
<td>Daily packet use for 1 wk</td>
<td>Within 24 h of the stroke</td>
</tr>
<tr>
<td>6 (MB)</td>
<td>ICH</td>
<td>Basal ganglia</td>
<td>55</td>
<td>Female</td>
<td>African American</td>
<td>None</td>
<td>BC Powder</td>
<td>Daily packet use for 1 wk</td>
<td>Within 24 h of the stroke</td>
</tr>
</tbody>
</table>

HTN = hypertension, OSA = obstructive sleep apnea.
5. Conclusion

OTC analgesic powders such as BC Powder and Goody’s Powder may be associated with increased risk of hemorrhagic stroke in African Americans who have minimal to no stroke risk factors, likely due to their formulations containing high amounts of aspirin. Providers should inquire about the use of these powders in ICH patients particularly among African Americans.

Author contributions

Conceptualization: Fadi Nahab.

Data curation: Brittain Davis, Fadi Nahab, Ghada A. Mahmoud, Laura Beth Durm, Syed Ali Raza.

Formal analysis: Ghada A. Mahmoud, Laura Beth Durm, Syed Ali Raza.

Methodology: Fadi Nahab.

Supervision: Fadi Nahab.

Writing – original draft: Ghada A. Mahmoud, Syed Ali Raza.

Writing – review & editing: Fadi Nahab, Haseeb Rahman.

References


