

Research Article

A Case Report of the Effect of Noni Juice on Crohn's Disease

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Abstract: The aim of the current case study was to evaluate the possible role of noni juice in the improvement of Crohn's disease symptoms. A 35-year-old male suffered from Crohn's disease for more than 10 years. Treatment prior to consumption of noni juice involved multiple monthly adalimumab injections, which lowered C-Reactive Protein (CRP) levels to 1.2 mg/L, even though symptoms persisted. Six months after he began drinking noni juice, including one month of consuming a combination of noni juice and olive leaf extract, his symptoms improved and CRP decreased to 0.0 mg/L. These improvements accompanied gradual decreases in adalimumab injection frequency, followed by cessation altogether. Noni juice possesses anti-inflammatory properties that involve multiple mechanisms, including immunomodulation. Relevant experimental data are reviewed and discussed within the context of this case.

Keywords: Anti-inflammation, Crohn's disease, immunomodulation, *Morinda citrifolia*, noni

INTRODUCTION

Crohn's disease is a chronic inflammatory disorder of the gastrointestinal tract. Historically, this condition was described as non-specific granuloma of the intestine and was likely first reported in 1806 as a case of "stricture and thickening of the ileum" (Taylor, 1949). The disease was initially described by a Polish surgeon, Antoni Leśniowski (Bartnik, 2003) and by an American gastroenterologist, Burrill Bernard Crohn, as regional ileitis (Crohn *et al.*, 1952). Symptoms of this condition may include diarrhea, abdominal pain, fever, anemia, weight loss and right lower quadrant mass (Berkow and Fletcher, 1992).

As etiology varies, treatment may not be uniform. But some common approaches do exist. Antibiotics may be required to treat infections in some cases, but aminosalicylates, glucocorticosteroids and immunomodulators are commonly used to control inflammation in patients with Crohn's disease (Kozuch and Hanauer, 2008). Some natural remedies, such as fish oil, probiotics, antioxidants and some herbal therapies may provide some benefit (Pithadia and Jain, 2011). Biologic agents have been developed, such as adalimumab, which include monoclonal antibodies directed against cytokines involved in inflammatory processes (Martínez-Montiel and Muñoz-Yagüe, 2006).

The objective of the current case study was to evaluate the possible role of noni juice in the improvement of Crohn's disease symptoms. As such, the author reports a case of a man with Crohn's disease who reportedly experienced improvement after drinking noni juice. Also, studies of the anti-inflammatory and immunomodulatory potential of noni juice are reviewed in light of this case.

METHODOLOGY

Through an associate, the author became aware of a 35-year-old Austrian male who suffered from Crohn's disease for more than 10 years. From January to April 2012, this man was contacted to obtain details of his condition and its progression during the past few years. Written consent was also given to obtain his medical records and verify laboratory results. A literature search was also performed for scientific publications reporting anti-inflammatory and immunomodulatory studies of noni juice.

RESULTS AND DISCUSSION

It was found that within the previous three years (in 2008) that the subject's CRP levels had become elevated, which were reported to be as high as 12.0 mg/L. His overall energy level was low, disease symptoms had worsened and he lost more than 15 kg, dropping to a body weight of 49 kg. Blood tests confirmed low hemoglobin levels and hematocrit. As his prognosis was very poor, his doctors recommended that he be treated with four monthly adalimumab injections. This lowered his CRP levels. During April 2008, laboratory tests revealed that his CRP was 1.9 mg/L. This value continued to decline and, in July of that year, was 1.1 mg/L. By March of 2009, his CRP had declined to 0.2 mg/L, but again rose to 1.0 by June of that year. CRP levels were approximately 1.2 mg/L for the remainder of the year. His energy levels, as well as body weight, remained low and pain persisted.

In May 2010, the man began drinking 60 mL noni juice per day. He reported feeling an improvement in energy levels very soon afterwards. Four months later,

Table 1: Laboratory values of a 35-year-old male with Crohn's disease after drinking noni juice for 14 months

Measurement	Result	Reference range
C-reactive protein (mg/L)	0.00	0-0.5
Hematocrit (%)	47.20	42.0-52.0
Hemoglobin (g/dL)	15.50	14.0-18.0
Mean cell volume (femtoliter)	86.50	80.0-96.0
Thrombocytes (10 ⁹ /L)	258.00	150-450
Erythrocytes (10 ¹² /L)	5.45	4.50-5.90
Leucocytes (10 ⁹ /L)	6.20	4.0-9.5
Basophils (%)	2.00	0-2
Eosinophils (%)	3.00	0-7
Lymphocytes (%)	25.00	20-45
Monocytes (%)	9.00	2-12
Neutrophils (%)	62.00	45-75
Creatinine (mg/dL)	1.11	0.72-1.25
Urea (mg/dL)	38.00	20.0-44.0
γ -glutamyltransferase (U/L)	15.00	12-64
Alkaline phosphatase (U/L)	61.00	40-150
Alanine aminotransferase (U/L)	22.00	0-55
Aspartate aminotransferase (U/L)	21.00	5-34
Lactate dehydrogenase (U/L)	142.00	125-243
Potassium (mmol/L)	4.60	3.5-5.1
Sodium (mmol/L)	139.00	136-145
Chloride (mmol/L)	101.00	98-107
Calcium (mmol/L)	2.56	2.10-2.55

in September, he increased his daily dose to 120 mL. Afterwards, his abdominal pain decreased and sense of wellbeing improved. One month later, in October, he began consuming 120 mL of a noni juice product that also contained olive leaf extract. During November 2010, he added noni fruit puree to the regimen, mixing one part puree to two parts of the noni-olive leaf extract blend. During this time his symptoms continued to improve. His November tests revealed that his CRP had decreased to 0.0 mg/L. These improvements accompanied gradual decreases in adalimumab injection frequency, followed by cessation altogether. The four adalimumab injections were decreased by one every month until no longer required. As recent as July of 2012, the man's CRP remained at 0.0 mg/L. After consuming noni juice for 14 months, other laboratory values were normal (Table 1).

A search of the literature revealed some possible biological activities of noni juice that may explain the improvement in the man's symptoms. Noni fruit has demonstrated anti-nociceptive (pain suppressing) activity in mice. The pain killing activity was comparable to the central analgesic tramadol and the peripheral analgesic metamizol (Basar *et al.*, 2010). *In vitro* studies have also revealed the potential of noni juice to inhibit Cyclooxygenase-2 (COX-2) activity, as well as that of 5-lipoxygenase (Su *et al.*, 2001; Palu *et al.*, 2004). Further, noni juice inhibited COX-2 *in vivo* in the carrageenan-induced rat paw edema assay (Dussossoy *et al.*, 2011).

Besides possible direct inhibition of COX-2 enzymes, noni juice appears to decrease cellular expression of this pro-inflammatory enzyme, as well as pro-inflammatory cytokines. Feeding of noni juice to neonatal foals (newborn horses) decreased monocyte expression of Tumor Necrosis Factor-alpha (TNF- α) and COX-2 (Xu *et al.*, 2006). COX-2 inhibitors have

shown promise as possible therapies for Crohn's disease, as COX-2 expression is elevated in this condition (McCartney *et al.*, 1999; Romero *et al.*, 2008). Therefore, noni juice's activity against COX-2 alone could account for much of the improvement in symptoms and the reduction in systemic inflammation in the subject of this case report. But adalimumab is a monoclonal antibody that inhibits TNF- α binding to tumor necrosis factor receptors (Lichtenstein *et al.*, 2008) and noni juice appears to produce a similar effect. However, noni's effect appears to be via down regulation of TNF- α gene expression rather than direct binding and inactivation of TNF- α itself. This fact might explain why adalimumab therapy was reduced and eventually longer required, even while symptoms continued to improve.

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