The treatment of patients with mycotoxin-induced disease

William J Rea¹, Yaqin Pan¹ and Bertie Griffiths²

Abstract
Twenty-eight incapacitated individuals (average 43 years old, 7 males, 21 females, range 12-70) exposed to molds and mycotoxins were studied and treated with a protocol of cleaning up or changing their environment to be mold free. Injections of the optimum dose of antigens were given as part of the treatment protocol as was oral and intravenous (i.v.) antioxidants; heat depuration (sauna); physical therapy with massage and exercise under environmentally controlled conditions; oxygen therapy at 4-8 L/min for 2 hours with a special wood-grade cellophane reservoir and a glass oxygen container. Many patients were sensitive to plastics; therefore, exposures to these were kept to a minimum. Autogenous lymphocytic factor was given as an immune modulator. Of 28 patients, 27 did well and returned to work. One patient improved but did not return to work during the period of study.

Keywords
Antigens neutralization, anti-fungal drugs, oxygen, vitamins, chemical sensitivity, rotary duct

Introduction
In an earlier study, we have reported our analysis of mycotoxins in the air (Curtis et al., 2004; Rea et al., 2003). The treatment of mycotoxicosis is extremely difficult because both the individual and the individual’s environment must be treated for a successful result. This treatment starts with reducing the total environmental load and the total body load of molds, mycotoxins, and toxic chemicals followed by optimal dose neutralization injection of molds and mycotoxins and other foods and chemicals to which the patient has become sensitized; oral and parenteral nutrition; heat depuration (environmentally clean sauna); exercise and massage; if needed, immune modulators such as autogenous lymphocytic factor, gammaglobulin, and autogenous bacterial vaccines. If needed, medications like anti-fungal drugs (Nystatin, Nizoral, Diflucan), cholestyramine, and activated charcoal were used.

Materials and methods
Between the years 2006 and 2008, 168 patients with mycotoxicosis were seen at the Environmental Health Center, Dallas. The patients were diagnosed by history, physical, urine, and analysis of sputum and sinus, and nasal secretions. All the patients also had intradermal provocation of their mycotoxins–aflatoxin, ochratoxin and tricothecene to explore mycotoxin sensitivity. Of these patients, 28 were selected to follow the aforementioned treatment protocol in the introduction. Patients were selected on the ability to clean their houses by our criteria, the ability to precisely take their antigens, their ability to manipulate and take nutrients, and by their ability to tolerate saunas. The patients were treated in environmentally safe housing for a minimum of 3 weeks or until their homes were remodeled. All patients completed the protocol.

Total environmental load (Rea, 1992, 1994) was reduced by professional cleaning of the building involved. Mold cultures were taken before and after the cleaning. Forty percent of the patients had to leave the building permanently because even after the cleaning and negative mold plates, they still could not tolerate the building. This intolerance appeared to be
due to residual mycotoxin and/or the patient’s inability to tolerate building repair and residual toxic chemicals that they could previously tolerate.

Total body load (Rea, 1997a,b,c) was reduced by having the patients drink less polluted glass bottled spring water and eat organic food with a rotary diet so that the patient would not eat the same food more than once in 4 days. The patients would avoid any food to which they were sensitive. The patients had to move out of the contaminated building where they lived or worked until it was deemed acceptable to them.

The intradermal provocation-neutralization technique (Lee et al., 1969; Rinkel, 1949) was used to test and treat the offending molds and mycotoxins (aflatoxins, ochratoxins, and tricothecenes). After an appropriate starting dose was found, treatment injections were given subcutaneously every 4 days. Nutritional supplementation (Rea, 1997a,b,c) was given orally consisting of vitamin C, 6000 mgm daily; B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, B<sub>5</sub>, B<sub>6</sub> 100 mgm daily; B<sub>12</sub> 1000 mcg two times per week, and folic acid 1 mgm two times per week. Vitamin D<sub>3</sub> 400-1200 units per day, natural vitamin E 400-1200 IU daily and vitamin A 5000 units daily. Care must be taken to define the source, such as, corn, potato, beet, tapioca, soy, yeast, etc. Any vitamin that the patient could not tolerate was eliminated. Minerals were given daily, including calcium citrate 1000 mgm; magnesium citrate and aspartrate 500 mgm; zinc picolinate or orotate 300 mgm; potassium citrate and asparate 99 mgm; magnesium gluconate 10 mgm; copper gluconate 2 mgm; selenium methionine 200 µg; chromium 200 µgm; and molybdenum 200 µgm.

Essential and semi-essential amino acids (600-2000 mgm) were given daily including L-tryptophan, lysine, leucine, isoleucine, cysteine, valine, threonine, methionine, arginine, and glutathione. Lipids as a source of omega 3 and 6 EPA plus DHA were also given daily. Either three capsules or three teaspoonfuls were used. Salmon oil, cod oil, flax oil, primrose, borages, or black current oil was administered.

**Heat depuration and physical therapy**

Heat depuration was preferred in environmentally controlled saunas either conventional or infrared, whichever the patient could tolerate. Sweating of 20-30 min was allowed; and 20-30 min on an exer-cycle was followed by 20 min of deep massage – all performed under environmentally controlled conditions (Rea, 1997a,b,c).

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**Table 1. Patients: 28, intradermal skin testing for mycotoxins**

<table>
<thead>
<tr>
<th>Type of mycotoxin</th>
<th>Before treatment</th>
<th>After treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tricothecene</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Ochratoxin</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Aflatoxin</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2. Patients: 28, urine mycotoxins: 32**

<table>
<thead>
<tr>
<th>Type of mycotoxin</th>
<th>Before treatment</th>
<th>After treatment&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tricothecene</td>
<td>24</td>
<td>3&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ochratoxin</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Aflatoxin</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

<sup>a</sup> Decreased but present.  
<sup>b</sup> Realtime Laboratories, Dallas, Texas, USA (Hooper, 2008).

**Immune modulator**

All patients had an immune modulator (0.10 of the 1/10 dilution of concentrate) made of 30 culture generations of T-lymphocytes and processed according to the method of Griffiths. Each patient had this autogenous lymphocytic factor given every 4 days.

**Medication**

All patients received one course of an anti-fungal drug of either Diflucan 1 tablet (100 mg.) per day for 2 weeks or Nystatin 250,000 units every day for 1 month.

**Oxygen therapy**

All patients had oxygen therapy using a glass water reservoir, milk-grade tygon tubing, and a wood-derived cellophane reservoir 2 hours per day at 6-8 L (von Ardenne, 1990). For 18 days Wood-derived cellophane was used because patients could not tolerate synthetic petrochemicals in other plastics.

**Results**

All 28 patients (7 males, 21 females, ages 12-70 years, average age 43 years) completed the study. Ninety-five percent of the patients improved with treatment being able to return to normal function. In all, 24% patients had elevated tricothecene mycotoxins; 80% returned to non-detectable at the end of the study; 6 had elevated aflatoxin and 100% became non-detectable; and 2 had increased ochratoxins and both returned to normal (Tables 1 and 2).
Discussion

These patients were extremely sick and barely functional. It was clear that if they did not move out of the toxic building that they worked or lived in, they would be incapacitated. This was because the minute they came into the building, their symptoms would start and then after a few minutes to hours, they become non-functional. Many patients had damaged their systems although the buildings were rendered mold free after remediation; they still could not tolerate them. Mold cultures were negative so it was presumed that mycotoxins were still in the building; however, with constant monitoring of the patient and with treatment one could see the mycotoxins going down until they were eliminated (Table 2). This monitoring appeared to be very important since some patients did at times increase their mycotoxins even though they apparently were not exposed again. This temporary increase appeared to be due to mobilization of the toxics sequestered in the body since they were not re-exposed to molds or mycotoxin. The patients continued to improve over time until they were well. Apparently, sauna, oral nutrients, and oxygen therapy (Rea, 1997a,b,c) helped neutralize and eliminate the mycotoxins in the patients.

Oxygen therapy appears to be important in these patients due to spasm and closure of parts of the microcirculation caused by the mycotoxins. Once these vessels opened, the patient’s detoxification systems seemed to work better and the patient cleared more rapidly (von Ardenne, 1990).

It was clear that avoidance alone did not stop the disease process from spreading as these patients had to have other therapy such as intradermal provocative neutralization testing and treatment not only for molds that they actually were initially exposed to but also to those common in the outside air. The recognition of the chemically hypersensitive stage in mold and mycotoxin-exposed individuals is frequently overlooked. It can be ignored or does not even exist in the milder cases. These type of patients get well with the avoidance of the mold exposure and were not included in the series of 28 patients. Frequently, the injection of the optimum dose obtained by the neutralization technique rapidly stopped the spreading phenomena and allowed these patients to become less hypersensitive. In addition to the mold sensitivity spreading, many of these patients developed a further spreading phenomenon in which they became sensitive to foods and ambient chemicals. As our experience has grown, to obtain optimal results it appears necessary to treat the severe cases of mold/mycotoxin exposure as if they were chemically sensitive. Failure to reorganize the hypersensitive stage may result in less than satisfactory results.

Some patients in this series had such a damaged immune system that they had to have an immunomodulator to right the immune system. This substance is an autogenous lymphocytic factor developed by the Environmental Health Center, Dallas. The process takes 6 weeks of incubation after the patient’s lymphocytes are harvested from a blood draw (Griffiths et al., 1998). Injection of this substance every 4 days appears to stimulate the T-cells to return to normal. Heat, depuration, and physical therapy appeared to decrease these patients’ total toxic load of mycotoxins. They became more energetic and less hypersensitive as the treatment progressed.

Nutrient replacement and supplementation was difficult in these patients because they were often hypersensitive to the source, i.e. vitamin C-corn, Brewer’s yeast, etc. and could not tolerate them. Often, they had to have injections to neutralize the source material. Nutrient supplementation was often necessary to eliminate clinical symptoms.

Conclusion

With the aforementioned protocol, a small group of specially selected severely ill patients were treated and improved. A larger group of patients should be tried on this treatment protocol.

Declaration of Conflicting Interests

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

References


