Hunger Strike and its medical management

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ABSTRACT

Hunger strike is the absence of food intake for 3 consecutive days (typically 9 meals). A broader and more useful definition of a hunger strike is the following: “an action in which a person or group of persons, with decision-making capacity, refuses to ingest vital nourishment until another party accedes to a specific demand.”

The medical, psychological, social, ethical, and legal aspects of managing hunger strikers are very complex, and physicians caring for them face difficult dilemmas. To provide adequate medical care, the physician must understand the complex physiologic events that ensue after prolonged starvation. Understanding the political, psychological, and social circumstances that surround the hunger striker is an equally important aspect of the clinical management. Careful vigilance for development of refeeding syndrome is of key importance. A multidisciplinary approach to hunger strikes is of utmost importance. This review is intended mainly toward physicians, an interdisciplinary approach to the care of the individual involving physicians, nurses, medics and dietitians.

KEY WORDS: Hunger strike, fasting, starvation, refeeding syndrome

INTRODUCTION

The conscious decision to refuse food or fluids to achieve a goal or set of demands is hunger strike. Fasting is a method of protesting injustice. The definition of a hunger strike varies from institution to institution, but one of the most widely accepted definitions is the absence of food intake for 3 consecutive days (typically 9 meals). A broader and more useful definition of a hunger strike is the following: “an action in which a person or group of persons, with decision-making capacity, refuses to ingest vital nourishment until another party accedes to a specific demand.”

Most hunger strikers will take liquids but not solid food. The medical ethics of a physician’s relationship with hunger striker has become a major public, professional, and governmental concern in Nepal. Because of unstable political situation in Nepal, there are many cases of hunger strike for justice and some of them are totally political demand. Among these, two civilian husband and wife undergone long hunger strike. Unfortunately one of them passed his life after complication of hunger strike.

The medical, psychological, social, ethical, and legal aspects of managing hunger strikers are very complex, and physicians caring for them face difficult dilemmas. To provide adequate medical care, the physician must understand the complex physiologic events that ensue after prolonged starvation. Understanding the political, psychological, and social circumstances that surround the hunger striker is an equally important aspect of the clinical management. Careful vigilance for development of refeeding syndrome is of key importance. A multidisciplinary approach to hunger strikes is of utmost importance. This review is intended mainly toward physicians, an interdisciplinary approach to the care of the individual involving physicians, nurses, medics and dietitians.

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Physiological Response to Starvation

Early on, glycogen stored in muscles and in the liver is mobilized as an energy substrate.\textsuperscript{2,3} The brain normally uses glucose as its sole source of energy, but under starvation conditions, it can temporarily substitute for a fat-derived source such as ketones. Of note, gluconeogenesis from aminoacids (mainly from muscles, including the heart) still occurs and generates some energy substrate for brain functioning.\textsuperscript{2,3} Glycogen stores are used in a few days, and the body shifts to using glycogen from striated and cardiac muscle as the main source of energy.\textsuperscript{2,3} Prolonged starvation will eventually lead to severe protein loss and death. Most experts agree that loss of more than 30% is life-threatening (based on lean body weight). One must bear in mind that the protein loss occurring during starvation is not only occurring in peripheral muscle but also affecting vital organs such as the heart.\textsuperscript{3}

Common causes of death among hunger strikers includes superimposed infection, sepsis, severe dehydration, ventricular fibrillation, heart failure, severe neurologic dysfunction with ensuing aspiration (Wernicke syndrome), severe electrolyte disturbances, and gastrointestinal bleeding due to pseudo-dysentery.\textsuperscript{4}

Management of the Hunger Strike Patient

The specific management of a hunger striker will vary depending on the individual’s clinical condition, the dietary patterns before and during the hunger strike, concomitant illness, and confinement circumstances. Close medical monitoring is warranted when there is a ≥10% decline in ideal body weight.\textsuperscript{5} During initial contact with the hunger striker, baseline height, weight, and body mass index should be obtained, and a thorough clinical exam should be performed. Attention must be paid to co-morbidities that may place the individual at higher risk during fasting (chronic infections, metabolic disorders, marasmus, etc). Baseline blood counts, chemistry panel, liver function tests, and serum albumin should be obtained. The hunger striker should be encouraged to ingest water (ideally mixed with hydration salts), sucrose, and vitamins (particularly thiamine). If hydration salts are not available, ingesting water (30-35 mL/kg/d) along with half teaspoon of salt may help prevent dehydration and hyponatremia.\textsuperscript{5} The individual should be placed in a room with a comfortable temperature to prevent increased insensible losses. Signs of dehydration should be corrected by increasing the amount of fluid intake by mouth or by the intravenous (IV) administration of crystalloids. Hypoglycemia should be corrected with oral or IV glucose solutions. Thiamine supplementation should be in place prior to administration of glucose-containing solutions. Electrolyte replacement can be performed orally or intravenously depending on the specific clinical circumstances. Other medical measures may include administration of H2 blockers, stool softeners, analgesics, antidepressants, and medications for skin care.

The World Medical Association has issued a statement regarding medical management of hunger strikers.\textsuperscript{6} In addition, the Declaration of Malta is a valuable document that outlines physicians’ duties and detainee rights during hunger strikes.\textsuperscript{6} The appendix contains the Declaration of Malta.

Once nutrition has been re instituted, the clinical team must monitor the patient for signs/symptoms suggestive of refeeding syndrome.\textsuperscript{7} During the starvation phase, the individual depends on fat and protein catabolism for all energy requirements. During refeeding, carbohydrates are reintroduced, requiring metabolism to shift from fat and protein to carbohydrates. The metabolic change leads to a massive increase in insulin production. The increase in insulin level shifts glucose, phosphate, magnesium, and potassium to the extracellular space. In addition, the carbohydrate load reduces sodium and water excretion, leading to expansion of the extracellular compartment and potentially to fluid overload.

Another possible neurologic complication of prolonged starvation is the development of beriberi as a result of vitamin B\textsubscript{1} deficiency.\textsuperscript{8} Dry beriberi is manifested by a distal motor and sensory neuropathy that is relatively symmetric. The term wet beriberi is used when the neuropathy is accompanied by heart failure.\textsuperscript{8}

Acute starvation can cause significant myocardial dysfunction that may even be fatal. Gelatinous atrophy of pericardial fat, brown atrophy of cardiac muscle, serous pericardial effusions, and interstitial edema are common findings in autopsy studies of hunger strikers.\textsuperscript{4} Beriberi due to thiamine deficiency can lead to heart failure (wet beriberi). Thiamine deficiency leads to impaired oxidative phosphorylation, increased levels of pyruvate, and decreased transketolase activity in the heart, red blood cells, and liver.\textsuperscript{8}
Anemia is quite common among individuals who undergo prolonged fasting and is most often a microcytic, hypochromic anemia secondary to iron loss. Other common laboratory findings include leukocytosis, elevated liver transaminases, hypo- or hypercholesterolemia, elevated creatine kinase, hypokalemia, and mild hypoglycemia. Starvation-related ketonuria is a common early finding.\textsuperscript{9} Prolongation of the QT interval is a worrisome electrocardiogram (EKG) finding as it may signal an increased risk for lethal arrhythmias.\textsuperscript{9}

Prior to administering any form of nutrition, the patient should receive thiamine (IV) and oral or IV multivitamins to prevent Wernicke syndrome and enhance nutrient use. Prevention of the refeeding syndrome requires slow introduction of enteral nutrition at a rate not to exceed 50% of the daily energetic requirements. In high-risk patients, some experts suggest increasing nutrition at a rate of 10 kcal/kg/d to achieve full nutrition support in 4–7 days. In patients with profound malnutrition, it is recommended that nutrition be started at a rate of 5 kcal/kg/d with careful cardiac monitoring. IV fluids must be administered judiciously due to the risk of inducing fluid overload. Daily measurement of electrolytes is recommended during the first week, whereas every-other-day measurements need during the second week.

### Diagnostic Criteria/Evaluation of Fasting and Refeeding Syndrome

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<tr>
<th>Fasting</th>
<th>Refeeding Syndrome</th>
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<td>Patients may be at high risk for complications from fasting with any of the following:</td>
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<td>1. Pregnancy</td>
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<td>2. Elderly (&gt;65 years of age)</td>
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<td>3. Baseline BMI less than 18.5 kg/m(^2)</td>
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<td>4. Taking medications that may pose a risk during prolonged fasting (e.g., insulin, antacids, diuretics)</td>
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<td>5. Chronic medical conditions such as: diabetes, hypertension, cancer, malabsorption, end stage liver disease, renal disease, inflammatory bowel disease, congestive heart failure, ischemic heart disease, etc.</td>
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<td>Negligible Risk</td>
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<td>High Risk</td>
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1. Patients requiring monitoring due to medical risks
2. Patients with: a BMI >16 but ≤18.5 kg/m\(^2\), loss of >10% but ≤15% of body weight during food refusal and food refusal of 15-28 days
3. Low potassium, magnesium, or phosphate levels before resumption of feeding
4. Food refusal for more than 28 days
5. Medical or mental health conditions creating high risk of complications from fasting

The Declaration on Hunger Strikers (Declaration of Malta) defines a hunger striker as “a mentally competent person who has indicated that he has decided to embark on a hunger strike and has refused to take food and/or fluids for a significant interval”.\textsuperscript{6}

We define a hunger strike as “an action in which a person or persons with decision making capacity (often, but not always, in prison) refuses to ingest vital nourishment more than 72 hours until another party accedes to certain specified demands.”

Starvation involves metabolic changes and can cause severe, and sometimes even irreversible or fatal complications. Moreover, the phase of re-alimentation should not be trivialised, as re-feeding syndrome is a potentially fatal phenomenon. This article provides guidance for monitoring and management of patients on hunger strike.\textsuperscript{10}

Within 24 hours after confirmation of a detainee in hunger strike, a thorough medical evaluation must be made, especially to define modalities of
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fasting and to determine whether the patient has co-morbidities (physical and/or mental). As early as possible, physicians should also acquire a detailed medical history and make a thorough examination. Some situations may be life-threatening in less than a week. Absolute fasting (not only no food but moreover no fluid intake) is not compatible with life for more than a few days. Significant co-morbidities or drugs with a narrow therapeutic window can lead to severe complications. Any mental disorder must be ruled out. The healthcare professional must explain the reason for medical follow-up and inform the striker of the health risks he/she exposes him-/herself to. The physician must proceed with medical and laboratory assessments to get baseline data and thereafter approximately once a week, depending on clinical and biological abnormality.

I define three modalities of hunger strike. Absolute fasting means no food and fluid intake. This option is rare: as the body cannot survive more than a few days without fluid, the period for negotiation is too short to be effective. Total fasting involves taking only water and abstention from all foodstuffs; salt (either sodium chloride alone or a combination of minerals) is often added to the water. In case of partial fasting, the striker takes some form of liquid nourishment (e.g., sugar, honey) and only abstains from solid food. Some forms of partial fasting are considered as “cheating” by the authorities, however if prolonged, lead to death but at a much later stage than a total fast.

Early identification of any medical condition that may put the striker at increased risk of complications is also essential. A refusal to feed for religious motives, inability to eat by virtue of a somatic disease or fasting as a manifestation of a mental illness must be rapidly ruled out During a starvation state, malnutrition can affect every system and leads to a broad spectrum of conditions like vitamins deficiencies (Wernicke-Korsakoff syndrome), electrolytes imbalance (heart arrest), ketone metabolism (dramatic loss of weight and acidosis), decreased protein synthesis (immunosuppression).

The net result of metabolic and hormonal changes in early starvation is that the body switches from using carbohydrate to using fat and protein as the main source of energy. The body consumes its glycogen reserves within 2 or 3 days, and then some amino acids take over as substrates for gluconeogenesis during a few days. During prolonged fasting, hormonal and metabolic changes aim to prevent protein and muscle breakdown (protein catabolism producing only about 10% of energy). Muscle and other tissues decrease their use of ketone bodies and use fatty acids as the main energy source. Thus, the human brain derives energy from fat stocks, permitting survival by starving in normal-weight persons for up to 2 to 2.5 months. When fat stocks are used up, a catastrophic protein catabolism will develop. Main somatic complications arising from these physiopathological mechanisms are dehydration (shock, renal failure, stroke), hypoglycaemic coma, metabolic disturbances (arrhythmias), vitamin deficiencies (Gayet-Wernicke), peptic ulcers and nephrolithiasis, with major risks associated with re-nutrition. Serious complications and death occur especially from the fortieth day on, but early and unexpected complications are possible. Close medical monitoring is recommended after a 10% of weight loss in lean healthy individuals. Serious medical problems begin at a loss of approximately 18% from initial body weight. The risk of neurological signs by thiamine (vitamin B1) deficiency is common in cases of fasting with exclusive intake of sugar and liquids. The physician should regularly repeat all these dangers to the patient.

A minimal daily fluid intake of 1.5–2 liter is necessary. This information should be regularly reminded to the patient, as the sensation of thirst decreases during fasting.

The re-nutrition phase must be very careful as re-feeding syndrome is a potentially fatal phenomenon. This syndrome usually occurs within four days after starting re-feeding. Nutrient re-introduction must sometimes be done in a hospital setting with a nutritionist’s help. During re-feeding, glycaemia leads to increased insulin and decreased glucagon. Insulin stimulates glycogen, fat, and protein synthesis. This stimulates cellular uptake of minerals, which can lead to profound hypophosphatemia, hypokalaemia and hypomagnesaemia. Beginning the re-feeding at a reduced calorific rate reduces the risk of re-feeding syndrome. Serum phosphate, magnesium, calcium, potassium, urea, and creatinine concentrations should be measured before feeding and repeated daily for four days after feeding is started. If hypophosphatemia...
occurs it should be corrected in addition to other electrolyte abnormalities, such as hypokalaemia and hypomagnesaemia. The conjunction of electrolyte imbalance increases the risk of arrhythmias and sudden death. 12,15

**CONCLUSION**

Medical management of hunger strike is very challenging to the physician that requires an organized, interdisciplinary approach to ensure an adequate outcome. Understanding the political, psychological and social circumstances that surround the hunger striker is an equally important aspect of the clinical management of hunger strike. The underlying medical condition as well as the environmental conditions will determine the individual medical response to fasting. Nutrition after prolonged starvation requires careful monitoring to identify individuals at risk of refeeding syndrome.

**REFERENCES:**