



## Health Impact Due to Prolonged Water only Fast by Jain Monk: A Case Report

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### ABSTRACT

Fasting consists of abstaining from all or part of food and drink for a given period of time. Fasting people have a therapeutic advantage, as fasting can promote weight loss, improve glycemic control, reduce the risk of heart disease, etc. The current investigation of a case was conducted on Jain monk to understand the health impact and generate myriad hypotheses based on prolonged fasting on water alone. Data were collected from a 46-years aged Tapasavi (Monk) who had started fasting on 'water only' for 170 days commencing from 14<sup>th</sup> January 2023 after taking consent. Blood investigations and Magnetic resonance imaging were also conducted. He was drinking only warm water of around 500 ml in the morning and 500 ml in the evening. The weight of the person in this case has been reduced from 46 KG at the time of initiation of the fasting to 40.3 KG at the end of fasting. It seems that his biological age corresponds to 18 years old person. Haemoglobin and white blood cells were in normal limit from baseline till last day of fasting. However, lymphocytes decreased. Serum urea increased to 64.88 mg/dl while uric acid increased three times from the baseline level. Serum bilirubin



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was elevated even during baseline and was also very high on the last day of fasting. Vitamin B12 level was in normal range even after 170 days of water only fast. Serum ketone bodies were raised. Magnetic resonance imaging findings were normal. In this case, blood levels for several indicators have fluctuated, which may mean that a lot of bodily organs aren't functioning properly. More so, this case study generated a number of hypotheses, and in order to create strong support for each hypothesis and long term health impact, the targeted longitudinal, case control, and cohort studies are required for generating robust evidence.

### Introduction

Evidence suggests that fasting or nutrient limits of various forms and duration have long been a component of social and sacred practices globally.<sup>1-4</sup> Fasting is seen as a way of detaching oneself from material concerns, and putting oneself in the shoes of the poorest. Depends on capacity and determination power peoples are doing fasting in accordance with set rules and meditation, which results in a detached transcendent condition. Fasting in general has been employed in medicine when other treatment modalities have been failed.<sup>5</sup> Fasting is a cost-effective, non-invasive treatment with generally low risk of negative consequences and the added advantage of enhancing physical fitness. There is a decrease in metabolism during fasting. Fasting also improves hematopoietic stem cell (HSC) usefulness and has been linked to self-renewal regulation.<sup>6</sup> As reported in medical literature, intermittent fasting improves digestion, aging of skin, sleep and balances blood sugar. It also reduces inflammation, builds stronger immune system and enhances cellular energy. It may be responsible for fat loss and decreases cholesterol which in turn helps in preventing heart diseases and may improve the vascular health.<sup>7</sup>

Fasting in the Jain religion is highly varied duration and some limited to water only. Fasting is observed by Jains at religious holidays like Siddha Chakra which occurs twice annually, during which they only drink water and consume one boiled food every day. And other one is Paryusanan which is an 8 or 10-day time of self-discipline during August-September in which only boiled water is consumed. Other variations in fasting also observed in Jain tradition. For example, chauvihar (type of intermittent fasting) where no food and water is taken after sunset, ekasana (taking a food in one

seating only in day time), Biyasana (taking a food in two seating only in day time), Ayambil is a type of periodic, intermittent fasting having health benefits due to calorie restriction, chrono-nutrition, and a special diet; food without sugar, dairy items and only boiled grains taken once a day. In this type of fasting, taking a boiled food without oil or ghee and green vegetables in one seating only in day time. This different kind of fasting can be one day only or can last up to several days or months depends on type of Tapascharyas. The term Upvas related to one day full fasting (24-36 hour) with or without water. Upvas in Jain tradition is frequently observed that may be single day or few days or even few months also. In India, almost all Jains are vegetarians, in line with the recommendation to pursue ahimsa. Very few cases of prolonged fast have been noticed among Jain monks but detailed medical information was limited for example in the cases of Mr. Hansratna Vijay ji Maharaj and Mr. Hira Ratan Manek. Mr. Hansratna Vijay ji Maharaj broke (Parna) the longest duration fast of 423 days (Fast without food / water only fast) on 1st November 2015, in a period of 494 days.<sup>8</sup> To undertake a 407-day fast in 480 days for the penance of Gunaratna Samvatsar Tap. He also completed 108 fasts in 2013 and 180 fasts in 2014. This is the highest tapascharya in Jainism. In all, he has completed 1722 days of fasting in the last 14 years. He consumed boiled water during the day (8:00 a.m. to 6:30 p.m.). The second case of Mr. Hira Ratan Manek aged 64 who has accomplished a water only prolonged fast for 411 days as per Jain tradition on February 14, 2001, and Parna (ending of fast) was done on 15<sup>th</sup> February, 2001 (Date of start of fasting 01-01-2000). He had also completed similar type of Jain fasting for 211 days in 1995-96.<sup>9</sup>

Numerous studies have evaluated the health benefits of food that are appropriately selected

by vegetarians. Risks of dietary deficiency are limited when diet is correctly planned including fortified foods, particularly in vegan diet.<sup>10-12</sup> Calorie consumption throughout Ramadan is generally normal<sup>13</sup> or somewhat higher than before Ramadan,<sup>14</sup> although there is a total calorie restriction during the Jain fast.

When energy intake exceeds energy output, the most common metabolic disruption that results is obesity, which raises morbidity and death. Measures to lose weight through fasting must obviously be of substantial therapeutic relevance by showing evidence that there is benefit in morbidity and mortality reduction. "Water only fasting" may be a useful alternative to lose weight and it also plays an important role in the pathophysiology of many conditions. Although there is little information on the time and length of water-only fasting, especially for prolonged fasting. Hence, a focused research approach is required in establishing the duration of water only fast or other intermittent fasting.

The current investigation of a case was conducted on Jain Monk to understand the health impact and generate myriad hypotheses based on prolonged fasting on water alone with the goal of developing evidence-based practices for various health issues including noncommunicable diseases (NCDs).

#### **Case Report (Description of A Case)**

A 46-years aged Tapasavi (Monk), well-educated and belonging to a Jain spiritual family of well socioeconomic status, renounced all worldly pleasures around a decade ago, had started fasting on 'water only' for 170 days starting from 14<sup>th</sup> January 2023. He is not on any medications at the time of fasting. After taking a consent, data collected through a detailed proforma and anthropometric measurements were also recorded. The case has been further assessed through physical and clinical examination by a physician. He was drinking only warm water of around 500 ml in the morning and 500 ml in the evening. The routine 6-monthly laboratory investigations have been conducted before starting water only fast (10<sup>th</sup> January 2023). These were considered baseline investigations. The investigations were repeated on 137<sup>th</sup> day and on 170<sup>th</sup> day of fasting and some other blood investigations were also added like serum phosphorus and ketone bodies. Magnetic

resonance imaging (MRI) of whole abdomen was also performed in consultation with a Radiologist and Physician to rule out any abnormality.

#### **Results**

##### **Effect of Fasting on Body Mass Index**

The height and weight were 165 cm and 46 KG respectively. After 170 days fasting, the weight has been reduced from 46 KG at the time of initiation of the fasting to 40.3 at the end of fasting with a BMI of 13.9. The pulse rate was 66 per minute and blood pressure was 89/59 mmHg, a day prior to his ending of the fast. His biological age corresponds to 18 years old person.

##### **Effect of Fasting on Blood Count Numbering and Biomarkers**

Haemoglobin and white blood cells (WBCs) were in normal limit from baseline till last day of fasting except lymphocytes. Serum urea increased to 64.88 mg/dl (much higher than normal range) while uric acid increased three times from the baseline level. Serum phosphorus level doubled in only 33 days (137<sup>th</sup> day to 170<sup>th</sup> day of fasting). Serum bilirubin was elevated even during baseline and was also very high on the last day of fasting. However, during baseline, direct bilirubin was very high (2.76 mg/dl) but on the last day of fasting the indirect bilirubin was very high (3.49 mg/dl) which may be due to the breakdown of the red blood cells (RBCs) faster than liver can keep up. Additionally, Vitamin B12 level was in normal range even after 170 days of water only fast. Serum magnesium level is in normal limit during last day of fasting while serum ketone bodies were raised. MRI was normal.

Urine analysis on the last day of fasting shows normal results except for few findings like presence of pus cells, calcium oxalate crystals and traces of ketones.

#### **Discussion**

In the current case, a considerable decrease in body weight after fasting has been noted. The BMI trend followed a similar pattern. Blood levels for a number of indicators have changed, which could indicate that many body organs are not operating as these should. There is also decrease in blood sugar level. Serum urea increased much higher than normal range. The most striking change in the blood is the dramatically increased uric acid concentration which is consistent

with study by Yahia Lebah.<sup>15</sup> Serum Phosphorus level doubled in only 33 days (137<sup>th</sup> day to 170<sup>th</sup> day of fasting). This may be due to prolong but limited water only fast. Phosphorus may be very high which may indicate advanced chronic kidney disease and may require further workup. But in general, fasting persons (those who are on 12 hours or more without food or drink except for water) had significantly lower serum phosphorus levels than non-fasting

participants. But surprisingly, the RBC count was higher from the 137<sup>th</sup> day (4.72 mi/cumm) to the last day of the fasting (4.95 mi/cumm). This may suggest that case might be suffering from chronic jaundice or may have some other liver disorders and may need thorough evaluation. Vitamin B12 level was in normal range even after 170 days of water only fast. This may be due to breakdown of RBCs as reported in medical literature.

**Table 1: Change in Anthropometric, and biochemical parameters from baseline to endline (Last day of the fasting) including blood level for Bilirubin, Creatinine, Protein, Urea, Uric acid, and minerals blood level**

Parameters	0 Day (Baseline Values)	137 <sup>th</sup> Day	170 <sup>th</sup> Day	Reference Value
Hb (gm/dL)	15.4	13.7	14.84	13.00 – 17.00
WBC (/Cumm)	5.7	4.5	5.32	4.00 – 10.00
Differential Leucocyte count (DLC)				
Neutrophils (%)	66	68.5	76.12	40 – 80
Lymphocytes (%)	24	23.3	17.78	20 – 40
Eosinophils (%)	4	1.7	0.45	1 – 6
Monocytes (%)	6	6	5.2	2 – 10
Basophils (%)	NA	0.5	0.45	<2.00
RBC Count (mi/cumm)	5.49	4.72	4.95	4.50 – 5.50
Platelet count (thou/mm <sup>3</sup> )	255	290	293	150 – 410
HCT/PCV (%)	47.4	41.9	45.2	40.0 – 50.0
MCV (FL)	86.3	88.9	91.3	83 – 101
MCH (pg)	28.1	29.1	30.0	27 – 32
MCHC (g/DL)	32.5	32.7	32.8	31.5 – 34.5
RDW-CV (%)	13.1	13.6	15.1	11.6 – 14.0
Serum Bilirubin (mg/dl)	3.13	3.41	4.09	0.30 – 1.20
Bilirubin direct (mg/dl)	2.76	0.61	0.6	<0.20
Bilirubin indirect (mg/dl)	0.37	2.8	3.49	<1.10
SGOT (U/L)	14.3	21.1	29.1	<50
SGPT (U/L)	14.7	11.9	17.3	<50
Total Protein (g/dl)	7.52	6.61	8.28	6.40 – 8.30
Serum albumin (g/dl)	4.28	4.54	5.3	3.50 – 5.20
Globulin (g/dl)	3.24	2.07	2.98	2.0 – 3.5
ALP (IU/L)	84	88.89	84.52	30 – 120
Serum Creatinine (mg/dl)	0.89	0.87	1.15	0.67 – 1.17
Urea direct (mg/dl)	17.3	33.91	64.88	17.00 – 43.00
Uric Acid (mg/dl)	3.2	7.0	9.17	3.50 – 7.20
Urea Nitrogen Blood (mg/dl)	NA	15.84	30.3	6.00 – 20.00
BUN / Creatinine Ratio	NA	18	26	
GFR estimated mL/minute /1.73m <sup>2</sup>	NA	108	79	>59
GFR Category	NA	G1	G2	
Calcium (mg/dl)	10	9.15	10.59	8.80 – 10.60
Phosphorus (mg/dl)	NA	4.19	8.09	2.40 – 4.40
Sodium (mEq/dl)	135.8	140.07	141	136 – 141

Potassium (mEq/dl)	5.47	4.13	5.76	3.50 – 5.10
Chloride (mEq/dl)	103.4	103.82	100.32	101.0 – 109.0
Ketone bodies (mmol/L)	NA	NA	5.39	0.02 - 0.27

Evidence suggests that during the Christian, Ramadan, and Jain fasts considerable weight reduction was seen in overweight and obese people.<sup>14, 16-19</sup> In this instance, persistent weight reduction was greater than that experienced during Ramadan, which is attributable to total calorie restriction rather than intermittent fasting. Numerous researchers have also noted a similar pattern in the weight reduction associated with fasting.<sup>19-21</sup> Loss of water is a crucial factor in the initial phase of weight loss during fasting; later on, body fat and muscle mass step in to make up for the calorie deficit. According to Herbert M. Shelton, energy sources are drawn from the organs, with the least essential being used first, followed by the essential, and finally, the most essential being hardly used at all.<sup>22</sup>

When it comes to anthropometric and cardiometabolic outcomes, modified alternate day fasting, in particular, has been proven to be advantageous when used as a weight loss strategy for people who are overweight or obese, according to a meta-analysis of a randomized clinical study by Patikom *et al.*<sup>23</sup> However, intermittent fasting has been proven to reduce insulin resistance, favorably change levels of adiponectin and leptin, and aid in weight loss. Numerous disorders, such as obesity, type 2 diabetes, hypertension, and cardiovascular risk factors, can benefit from intermittent fasting, as shown by pre-clinical and clinical investigations.<sup>24</sup> On days 137 and 170 (the last day of fasting), a considerable decline in fasting sugar level was seen. With a longer than a shorter fast, this decline can be more pronounced. The majority of research and a meta-analysis revealed that blood glucose levels decreased during Ramadan.<sup>20, 25, 26</sup> However, evidence also revealed that Jains' and Muslims blood sugar levels rise during the Paryusan and Ramadan fasts especially in Muslim women.<sup>16, 27</sup> It's possible that a small number of people have undiagnosed pre-diabetes or even diabetes, in which case fasting may worsen metabolic regulation and cause an increase in blood sugar due to an increase in stress hormone.<sup>16</sup>

High level of serum ketone bodies due to prolong water only fasting as carbohydrates (CHO) stores are significantly decreased or fatty acid (FA) concentration increased. Moreover, the body hasn't had enough glucose to function as its main energy source for an extended amount of time, it breaks down FA instead of CHO. However, persistent ketone level makes blood too acidic and the condition may be called starvation ketoacidosis which is a medical emergency and life-threatening condition and may need appropriate management after detailed evaluation.

Jain intermittent fasting often lasts from 14 to 16 hours (from evening 6 or 7 PM till noon the following day), which necessitates skipping breakfast. We argue that going without breakfast can be harmful and might result in overeating at lunch, which would raise blood sugar levels. Nutritionists may argue that a healthy breakfast helps a person maintain stable glucose levels throughout the day because it helps to control blood sugar levels and provides them the energy they need to start the day. Even a good breakfast is crucial for boosting metabolism. This, however, differ the Jain practice of intermittent 16–18-hour fasting.

Prolong water only fasting may help in reducing the weight which in turn may help in controlling NCDs however, we hypothesize that after stopping regular water only fasting, may result weight gain again. Fasting for up to three days may maximize the advantages of autophagy, which eliminates pathogens like viruses and bacteria. More so, up to 3 days fasting may lead to higher level of growth hormone, release of ketone bodies in to blood stream, fat burning, and less or no glycogen stores.<sup>28,29</sup> Another hypothesis may be, can a 3-day water only fast practice every 3 months lead to at least 30% reduction in the risk of cancer and diabetes over a 5-year period? Testing these hypotheses could provide valuable insights in to the potential preventive measures against cancers, diabetes

mellitus and weight loss. However, longitudinal research on a variety of populations can be used to evaluate the effects of prolonged water only fasts.

### Conclusion

The current case, the first of its sort regarding prolonged fasting, has conclusively shown weight reduction, a reduction in BMI, and a decrease in blood pressure. A biological age and BMI may be impacted by this prolonged water-only fasting and the history of multiple intermittent fasts. Further questionnaire-based studies are needed to assess the patient's psychological state, spiritual level and behavioral adjustments. This case received a complete but slowly paced liquid diet and is on routine follow-up. This case study generated various hypothesis and for each hypothesis targeted longitudinal, case control, and cohort studies are required to generate robust evidence at population level.

Dietary requirements, and medical follow-up especially persons suffering from chronic illnesses during religious worship and fasting practice should be considered accordingly. Hence, appropriate preventive measures to be taken by public authorities.

### Declarations

#### Authors' Contribution

Each author mentioned has significantly and directly contributed intellectually to the project and has given their approval for its publication.

#### Data Availability

The manuscript incorporates the dataset throughout this case report are obtained from the case and laboratory investigation records of the participant available at Jain Institute of Sumandeep Vidyapeeth.

#### Ethics Statement

Ethical clearance was obtained from the Sumandeep Vidyapeeth Institutional Ethics Committee (SVIEC) vide No. SVIEC/ON/Medi/RP/June/23/77 dated 30/06/23.

#### Competing Interests

The authors declare no conflicts of interest.

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