

# Prevention of infection in patients with cirrhosis with probiotic *Lactobacillus casei* Shirota

<b>Submission date</b>	<b>Recruitment status</b>	<input type="checkbox"/> Prospectively registered
26/03/2019	No longer recruiting	<input type="checkbox"/> Protocol
<b>Registration date</b>	<b>Overall study status</b>	<input type="checkbox"/> Statistical analysis plan
08/04/2019	Completed	<input checked="" type="checkbox"/> Results
<b>Last Edited</b>	<b>Condition category</b>	<input type="checkbox"/> Individual participant data
12/06/2023	Digestive System	

## Plain English summary of protocol

### Background and study aims

Patients with cirrhosis (scarring) of the liver are prone to infection. Bacteria which are normally present and confined to the bowel in health can get into the bloodstream in patients with cirrhosis and cause serious and often life-threatening infection with devastating effects on liver function. This is thought to be due to an imbalance in helpful and harmful bacteria in the bowel and problems with the body's immune defence system. Researchers have shown that probiotics, which are 'bio-friendly' food supplements, can alter gut flora and have a number of beneficial effects in cirrhosis. These include an improvement in markers of liver damage and restored function of important immune cells in patients with alcoholic liver disease. They have also been shown to improve outcome and reduce the risk of death in clinical conditions which have a similar basis to chronic liver disease. Probiotics could be very beneficial not only for in-patients who are acutely unwell, but also for out-patients to limit the likelihood of deterioration. This study is designed to assess the effects of a longer treatment with the probiotic *Lactobacillus casei* Shirota on infection rates, immune function, gut function and quality of life improvement in patients with any form of cirrhosis.

### Who can participate?

Patients aged 18-78 with cirrhosis

### What does the study involve?

Participants are randomly allocated into two groups. Group 1 receive Yakult yoghurt 3 bottles a day (65 ml each, containing *Lactobacillus casei* Shirota). Group 2 receive a similar looking and tasting placebo without bacteria. Participants are treated for 6 months. Blood samples are taken at the initial screening visit and at days 0, 14, months 1, 3, 6, 9, and 12. Routine tests are performed. Additional blood samples are collected at day 0, months 1, 6 and 12.

### What are the possible benefits and risks of participating?

Previous studies suggest that patients with liver disease do benefit from probiotic therapy in aspects of liver and immune function. Longer treatment with probiotics could reduce significant infection, improve immune function and quality of life. This study is being undertaken if there is

any benefit. Probiotic treatment is a food supplement which is associated with very few risks. We would however avoid using it in patients with inflammation of the pancreas. The main side effects of the supplement are a mild laxative effect and an increase in flatulence, the latter being regarded as a positive indicator of a high degree of fermentation, a sign that the supplements are working.

Where is the study run from?  
University College London (UK)

When is the study starting and how long is it expected to run for?  
August 2010 to February 2017

Who is funding the study?  
Yakult

Who is the main contact?  
Prof. Rajiv Jalan  
r.jalan@ucl.ac.uk

## Contact information

**Type(s)**  
Scientific

**Contact name**  
Prof Rajiv Jalan

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## Additional identifiers

**Clinical Trials Information System (CTIS)**  
Nil known

**ClinicalTrials.gov (NCT)**  
Nil known

**Protocol serial number**

02/0012

## Study information

### Scientific Title

Prevention of infection in cirrhosis with Lactobacillus casei Shirota: a randomised double-blinded placebo-controlled study

### Study objectives

Administration of Lactobacillus casei Shirota in patients with liver cirrhosis will improve innate immune function through alteration of the gut bacterial flora and gut barrier integrity.

### Ethics approval required

Old ethics approval format

### Ethics approval(s)

Approved by the Joint UCL/UCLH Committees on the Ethics of Human Research: Committee Alpha

Neil Hubbard, Research Portfolio Manager, Theme 4 (NIHR Divisions 6), Royal Free London NHS Foundation Trust, Royal Free Hospital, Research & Development Office, Lower Ground Floor, Room LG/306, Pond Street, London, NW3 2QG; Tel: +44 (0)20 7794 0500 ext: 36316; Email: n.hubbard@nhs.net), REC Ref: 02/0012

Ethics Committee at Basildon Hospital (James Hampton-Till, Director of Research, Basildon & Thurrock University Hospitals NHS Foundation Trust, Nether Mayne, Basildon, Essex, SS16 5NL; Tel: +44 (0)8451553111 ext 8988)

### Study design

Multi-centre double-blind placebo-controlled randomised controlled study

### Primary study design

Interventional

### Study type(s)

Treatment

### Health condition(s) or problem(s) studied

Cirrhosis

### Interventions

92 patients will be randomised into two groups:

Group 1: Oral Yakult yoghurt 3 bottles a day (65 ml each, containing Lactobacillus casei Shirota at a concentration of 108/ml)

Group 2: Similar looking and tasting oral placebo without bacteria (3 bottles per day)

The recruited patients will be treated for 6 months. Blood will be taken at the initial screening visit and at days 0, 14, months 1, 3, 6, 9, 12. Routine biochemistry and haematology will be performed. Additional blood will be collected at day 0, months 1, 6 and 12. Effect of serum on

the function of normal neutrophils will be determined cytokine concentrations, measures of bacterial translocation and intestinal permeability.  
Urine collected will be used for further metabolic profiling.

### **Intervention Type**

Supplement

### **Primary outcome(s)**

1. Neutrophil function assessed using phagoburst and phagotest at day 0, months 1, 6 and 12
2. Incidence of significant infection documented at time of clinical assessments at day 0, day 14, months 1, 3, 6, 9, 12

### **Key secondary outcome(s)**

1. Gut barrier function assessed using lactulose/rhamnose/xylose intestinal permeability assay at day 0, months 1, 6
2. Inflammatory, cellular and humoral response assessed using luminex at day 0, months 1,6,12
3. Quality of life assessed using SF-36 at days 0, 14, months 1, 3, 6, 9, 12

### **Completion date**

02/02/2017

## **Eligibility**

### **Key inclusion criteria**

1. Patients aged between 18-78 years
2. Clinical and radiological evidence of cirrhosis, and/or biopsy proven liver cirrhosis of any cause
3. Informed consent
4. Abstinence from alcohol for > 2 weeks at the time of screening for inclusion

### **Participant type(s)**

Patient

### **Healthy volunteers allowed**

No

### **Age group**

Adult

### **Lower age limit**

18 years

### **Upper age limit**

78 years

### **Sex**

All

### **Total final enrolment**

92

## **Key exclusion criteria**

1. Pugh score > 10
2. Clinical evidence of active infection
3. Antibiotic treatment within 7 days prior to enrolment
4. Gastrointestinal haemorrhage within previous 2 weeks
5. Use of immunomodulating agents within previous month (steroids etc)
6. Use of proton pump inhibitors for preceding two weeks
7. Concomitant use of supplements (pre-, pro-, or synbiotics) likely to influence the study
8. Renal failure (such as hepatorenal syndrome), creatinine >150 mmol/l
9. Hepatic encephalopathy II to IV
10. Pancreatitis
11. Other organ failure
12. Hepatic or extra-hepatic malignancy
13. Pregnancy

## **Date of first enrolment**

03/05/2011

## **Date of final enrolment**

03/04/2014

## **Locations**

### **Countries of recruitment**

United Kingdom

England

### **Study participating centre**

**Royal Free Hospital**

Pond Street

Hampstead

London

United Kingdom

NW3 2QG

### **Study participating centre**

**Basildon and Thurrock University Hospitals NHS Foundation Trust**

Nethermayne

Basildon

United Kingdom

SS16 5NL

## **Sponsor information**

**Organisation**  
University College London

**ROR**  
<https://ror.org/02jx3x895>

## Funder(s)

**Funder type**  
Industry

**Funder Name**  
Yakult

## Results and Publications

### Individual participant data (IPD) sharing plan

The data sharing plans for the current study are unknown and will be made available at a later date.

### IPD sharing plan summary

Data sharing statement to be made available at a later date

### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>		02/06/2020	12/06/2023	Yes	No
<a href="#">Participant information sheet</a>	Participant information sheet	11/11/2025	11/11/2025	No	Yes