Professor Mark Thursz
Imperial College Healthcare NHS Trust, London

<table>
<thead>
<tr>
<th>Speaker Name</th>
<th>Statement</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof Mark Thursz</td>
<td>Consultancy / Speaker fees from Janssen, Gilead, BMS, Abbott</td>
<td>November 2013</td>
</tr>
</tbody>
</table>
Treating NASH in HIV infection

Mark Thursz
Imperial College
42% of abnormal ALT was attributable to coinfection with HBV or HCV.
28% of those scanned had fatty liver.
16% had bridging fibrosis or cirrhosis.
European Epidemic of Obesity

% obese (BMI ≥ 30)
≤ 10  10.1-15  15.1-20  20.1-25  > 25  no data

Berghoefer et al. BMC Public Health 2008;8:200
HIV infected individuals are getting old and fat

n = 1286
Follow-up: 1985-2004

Crum-Cianflone, N et al. PlosOne, 2010
HIV and Metabolic Syndrome
A Comparison With the General Population

Paolo Bonfanti, MD,* Cristina Giannattasio, MD,† Elena Ricci, ScD,* Rita Facchetti, ScD,†
Elena Rosella, MD,‡ Marzia Franzetti, MD,§ Laura Cordier, MD,* Luigi Pusterla, MD,‖
Michele Bombelli, MD,† Roberto Sega, MD,† Tiziana Quirino, MD,¶ and Giuseppe Mancia, MD†

*P < 0.0001

Prevalence of MS Components in HIV Patients and Controls

Bofanti, P et al . JAIDS, 2007
NON-ALCOHOLIC FATTY LIVER DISEASE

• NAFLD represents a spectrum of progressive fatty liver disease.

• NASH Clinical Features:
  – Frequently asymptomatic
  – A fluctuating elevation of ALT and AST.
  – A characteristic histological appearance in the absence of a history of alcohol abuse.
    • Ideally almost no alcohol intake (<40g/week)
    • Realistically, 210/140g/week M/F
STEAHOSIS

STEATOHEPATITIS

FIBROSIS

CIRRHOSIS
Simple steatosis

31-42%

Radiologically investigated

Hadigan et al. J AIDS 2007 (n=33)
Guaraldi CID 2008 (n=225)
Crum-Cianflone N et al. JAIDS 2009 (n=216)

NASH

30-57%

Histologically investigated

Lemoine et al. AIDS 2006
Mohammed et al. JAIDS 2007
Ingiliz et al. Hepatol 2008
Crum-Cianflone N et al. JAIDS 2009 (n=216)

Significant liver fibrosis

21-30%

Lemoine et al AIDS 2006
Ingiliz et al. Hepatol 2008
Mohammed, SS JAIDS 2007
Causes of Death in HIV-infected patients

<table>
<thead>
<tr>
<th>Cause of death (N = 1597)</th>
<th>N (%)</th>
<th>Incidence rate (95% CI) per 1000 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIDS</td>
<td>792 (49.6)</td>
<td>5.12 (4.78-5.49)</td>
</tr>
<tr>
<td>Non-specified AIDS</td>
<td>190 (11.9)</td>
<td>1.23 (1.07-1.42)</td>
</tr>
<tr>
<td>AIDS infection</td>
<td>366 (22.9)</td>
<td>2.37 (2.14-2.62)</td>
</tr>
<tr>
<td>AIDS malignancy</td>
<td>236 (14.8)</td>
<td>1.52 (1.34-1.73)</td>
</tr>
<tr>
<td>Non AIDS malignancy</td>
<td>189 (11.8)</td>
<td>1.22 (1.06-1.41)</td>
</tr>
<tr>
<td>Non-AIDS infection</td>
<td>131 (8.2)</td>
<td>0.85 (0.71-1.01)</td>
</tr>
<tr>
<td>CVD</td>
<td>126 (7.9)</td>
<td>0.81 (0.68-0.97)</td>
</tr>
<tr>
<td>MI/IHD</td>
<td>51 (3.2)</td>
<td>0.33 (0.25-0.43)</td>
</tr>
<tr>
<td>Stroke</td>
<td>23 (1.4)</td>
<td>0.15 (0.10-0.22)</td>
</tr>
<tr>
<td>Other heart disease</td>
<td>52 (3.3)</td>
<td>0.34 (0.26-0.44)</td>
</tr>
<tr>
<td>Violence</td>
<td>124 (7.8)</td>
<td>0.80 (0.67-0.96)</td>
</tr>
<tr>
<td>Suicide</td>
<td>48 (3.0)</td>
<td>0.31 (0.23-0.41)</td>
</tr>
<tr>
<td>Substance abuse</td>
<td>42 (2.6)</td>
<td>0.41 (0.32-0.52)</td>
</tr>
<tr>
<td>Other violent death</td>
<td>34 (2.1)</td>
<td>0.22 (0.16-0.31)</td>
</tr>
<tr>
<td>Liver-related</td>
<td>113 (7.1)</td>
<td>0.73 (0.61-0.88)</td>
</tr>
<tr>
<td>Hepatitis-related</td>
<td>63 (3.9)</td>
<td>0.41 (0.32-0.52)</td>
</tr>
<tr>
<td>Other liver-related</td>
<td>50 (3.1)</td>
<td>0.32 (0.25-0.43)</td>
</tr>
<tr>
<td>Respiratory disease</td>
<td>25 (1.6)</td>
<td>0.16 (0.11-0.24)</td>
</tr>
<tr>
<td>Renal failure</td>
<td>24 (1.5)</td>
<td>0.16 (0.10-0.23)</td>
</tr>
<tr>
<td>Other causes with N&lt;20</td>
<td>73 (4.6)</td>
<td>0.47 (0.38-0.59)</td>
</tr>
</tbody>
</table>

1CVD cardiovascular disease (includes MI/IHD, stroke, heart failure/unspecified and other heart disease)

2MI/IHD myocardial infarction/ischemic heart disease

3Violent includes homicide, accident, suicide and substance abuse as well as ill-defined violent deaths.

Clin Infect Dis. 2010;50:1387-1396

The Antiretroviral therapy Collaboration, CID 2010, May
Gut Translocation Exacerbates NAFLD
MEATLOAF

Meat Loaf
BAT OUT OF HELL
SONGS BY JIM STEINMAN
Management

M: Make the diagnosis
E: Establish metabolic syndrome components
A: Assess lifestyle
T: Therapeutic approaches
L: Liver specific therapies
O: Offer clinical trials
A: Advice and targets
F: Follow-up
Management MEATLOAF

Make the diagnosis
• Raised ALT and/or steatosis on ultrasound examination
• Low to moderate alcohol consumption
• No hepatotoxic drugs
• Negative chronic liver disease screen

Establish metabolic syndrome

Assess lifestyle

Therapeutic approaches

Liver specific therapies

Offer clinical trials

Advice and targets

Follow-up
Is a Biopsy Always Necessary?

- Not always necessary but may be helpful.
- Calculate non-invasive scores
- Consider transient elastography
- Biopsy if:
  - Diagnosis uncertain/poor response
  - Indeterminant or high-risk non-invasive markers
  - ALT > 2 x ULN 3 months
  - Obese or DM or age <50
  - ALT values >80 IU/ml on two occasions.
  - Exclude alternative/secondary pathology
  - Stratify disease progression risk
NASH ACTIVITY SCORE (NAS)

- NAFLD Fibrosis Score =
  -1.675
  + 0.037 x Age (years)
  + 0.094 x BMI (kg/m²)
  + 1.13 x IFG/diabetes (yes = 1, no = 0)
  + 0.99 x AST/ALT ratio
  - 0.013 x platelet (x10⁹/L)
  - 0.66 x Albumin (g/dl).

- < -1.455 excludes fibrosis (NPV 88-93%).
- > 0.676 predicts fibrosis (PPV 82-90%).

Angulo et al, Hepatology, 2007
FIBROSCAN

DETERMINATION OF LIVER STIFFNESS

- Soft liver: no fibrosis
- Stiff liver: severe fibrosis
Management MEATLOAF

Make the diagnosis
Establish metabolic syndrome components
  • Hypertension
  • Dyslipidaemia
  • Obesity
  • Diabetes/impaired glucose tolerance
Assess lifestyle
Therapeutic approaches
Liver specific therapies
Offer clinical trials
Advice and targets
Follow-up
NAFLD, the hepatic manifestation of the Metabolic Syndrome

<table>
<thead>
<tr>
<th>Central obesity</th>
<th>Abdominal circumference:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Europeans ≥ 94 cm (M) ou ≥ 80 cm (F)</td>
</tr>
<tr>
<td></td>
<td>Americans: ≥ 102 (M) ≥ 88 cm (F)</td>
</tr>
<tr>
<td></td>
<td>Asians: ≥≥ 90 cm (M) ≥ 80 cm (F)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High Blood Pressure</th>
<th>Arterial Pression ≥ 130 mmHg and/or ≥ 85 mmHg or treated Hypertension</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Low cholesterol HDL</th>
<th>&lt; 0,4 g/L (1 mmol/L) (M) ou &lt; 0,5 g/L (1,3 mmol/L) (F) ou treated Chol</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>High blood triglycerides</th>
<th>≥ 1,5 g/L (1,7 mmol/L) or treated hyperTG</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>High Blood glucose</th>
<th>Glucose ≥ 1 g/L (5,6 mmol/L) or antidiabetic treatment</th>
</tr>
</thead>
</table>
Management MEATLOAF

M - Make the diagnosis
E - Establish metabolic syndrome components
A - Assess lifestyle
   • Detailed dietary history (consider food frequency questionnaire, 7-day food diary)
   • Daily activity/occupation
   • Formal exercise (type, frequency, duration, intensity)
T - Therapeutic approaches
L - Liver specific therapies
O - Offer clinical trials
A - Advice and targets
F - Follow-up
Management MEATLOAF

M: Make the diagnosis
E: Establish metabolic syndrome components
A: Assess lifestyle
T: Therapeutic approaches
  • Dietary advice/dietetic consultation
  • Exercise counselling/gym referral
  • Pharmacological modification to each component of the metabolic syndrome as per guidelines (eg, NICE)
  • Adjust medications according to potential secondary benefit (eg, angiotensin receptor blockers may have antifibrotic effects, GLP-1 agonists may promote weight loss)
L: Liver specific therapies
O: Offer clinical trials
A: Advice and targets
F: Follow-up
Diet

• **Dietary Factors**
  – Antioxidant vitamins (Vitamins C & E)
  – Fruit & vegetables
  – Omega-3-fatty acids
  – Fructose content

• **Obesity**
  – Energy (food) intake > Energy expenditure
  – Food portion size
Lifestyle Modification

• **Exercise**
  – Pedometers
  – Subsidised gym in hospital for group ‘get fit’ sessions
  – Resistance vs aerobic exercise

• **Behavioural Therapy**
  – Clear Targets
  – Positive Feedback
Regular Exercise

Exercising improves

- Insulin resistance
- Steatosis
- Independently from the weight loss

Fatty Liver assessment by spectrometry

Johnson, Hepatology 2009
Helmerhost, Diabetes 2009
Treating Obesity

- **Central appetite suppressants**
  - Rimonabant (Acomplia)
    - Cannaboid receptor antagonist
    - No longer available

- **Slowing absorption**
  - Orlistat (Xenical)
    - Lipase inhibitor
    - Reduces dietary fat absorption
    - BMI >30 or >28 plus Metabolic Syndrome
    - May cause steatorrhoea

- **Bariatric Surgery**
Effect of Weight Loss on ALT

Suzuki et al. J. Hepatol 2005
Statins and LFTs

- Statins do cause LFTs
- Statins do not cause liver failure
- Statins are **not** contraindicated in patients with
  - LFTs
  - Cirrhosis
  - NASH
- Statins are **contraindicated** in decompensated liver disease

- Check LFTs before starting statin therapy
- Do not monitor LFTs
  - Do as patients to report jaundice, fatigue, malaise

- An Assessment of Statin Safety by Hepatologists. Am.J. Cardiol 2006:

- NB DDI with Protease Inhibitors!
Management MEATLOAF

Make the diagnosis
Establish metabolic syndrome components
Assess lifestyle
Therapeutic approaches
Liver specific therapies
• Pioglitazone or
• Vitamin E
Offer clinical trials
Advice and targets
Follow-up
PIVENS Trial - Endpoint

• Primary Endpoint
  – \( \geq 1 \) point improvement on ballooning
  – No increase in fibrosis
  – Decrease in NAS \( \geq 2 \) points or decrease 2 points with \( \geq 1 \) point decrease in lobular inflammation or steatosis

• Secondary
  – Change in NAS score
  – Change in ALT
  – Insulin resistance
  – Lipid profiles
### PIVENS Results

**Table 2. Primary Outcome and Changes in Histologic Features of the Liver after 96 Weeks of Treatment.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Placebo</th>
<th>Vitamin E</th>
<th>Pioglitazone</th>
<th>P Value&lt;sup&gt;a&lt;/sup&gt; vs. Placebo</th>
<th>P Value&lt;sup&gt;a&lt;/sup&gt; vs. Placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary outcome†</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of subjects randomly assigned</td>
<td>83</td>
<td>84</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjects with improvement (%)</td>
<td>19</td>
<td>43</td>
<td>34</td>
<td>0.001</td>
<td>0.04</td>
</tr>
<tr>
<td><strong>Changes from baseline in histologic features</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of subjects with biopsy specimens at baseline and 96 wk</td>
<td>72</td>
<td>80</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steatosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjects with improvement (%)</td>
<td>31</td>
<td>54</td>
<td>69</td>
<td>0.005</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mean change in score</td>
<td>-0.1</td>
<td>-0.7</td>
<td>-0.8</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Lobular inflammation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjects with improvement (%)</td>
<td>35</td>
<td>54</td>
<td>60</td>
<td>0.02</td>
<td>0.004</td>
</tr>
<tr>
<td>Mean change in score</td>
<td>-0.2</td>
<td>-0.6</td>
<td>-0.7</td>
<td>0.008</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hepatocellular ballooning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjects with improvement (%)</td>
<td>29</td>
<td>50</td>
<td>44</td>
<td>0.01</td>
<td>0.08</td>
</tr>
<tr>
<td>Mean change in score</td>
<td>-0.2</td>
<td>-0.5</td>
<td>-0.4</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Total NAFLD activity score (mean change)</td>
<td>-0.5</td>
<td>-1.9</td>
<td>-1.9</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Fibrosis‡</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjects with improvement (%)</td>
<td>31</td>
<td>41</td>
<td>44</td>
<td>0.24</td>
<td>0.12</td>
</tr>
<tr>
<td>Mean change in score</td>
<td>-0.1</td>
<td>-0.3</td>
<td>-0.4</td>
<td>0.19</td>
<td>0.10</td>
</tr>
<tr>
<td>Resolution of definite nonalcoholic steatohepatitis (% of subjects)</td>
<td>21</td>
<td>36</td>
<td>47</td>
<td>0.05</td>
<td>0.001</td>
</tr>
</tbody>
</table>
## Pioglitazone Meta-analysis

### Table: Improved Patients

<table>
<thead>
<tr>
<th>Study, year</th>
<th>Reference</th>
<th>Improved(n)/Total (N)</th>
<th>Peto OR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ballooning</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ballooning</td>
<td></td>
<td>Control/TZD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belfort (2006)</td>
<td>23</td>
<td>5/21</td>
<td>3.39 (1.06–10.80)</td>
<td>0.039</td>
</tr>
<tr>
<td>Aithal (2008)</td>
<td>22</td>
<td>3/30</td>
<td>3.69 (1.09–12.44)</td>
<td>0.035</td>
</tr>
<tr>
<td>Ratziu (2008)</td>
<td>30</td>
<td>7/31</td>
<td>1.14 (0.36–3.60)</td>
<td>0.823</td>
</tr>
<tr>
<td>Sanyal (2010)</td>
<td>25</td>
<td>24/83</td>
<td>1.89 (1.00–3.58)</td>
<td>0.050</td>
</tr>
<tr>
<td></td>
<td></td>
<td>39/165</td>
<td>2.11 (1.33–3.36)</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Summary</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control/TZD</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5/21</td>
<td>3.39 (1.06–10.80)</td>
<td>0.039</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3/30</td>
<td>3.69 (1.09–12.44)</td>
<td>0.035</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7/31</td>
<td>1.14 (0.36–3.60)</td>
<td>0.823</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24/83</td>
<td>1.89 (1.00–3.58)</td>
<td>0.050</td>
</tr>
<tr>
<td></td>
<td></td>
<td>39/165</td>
<td>2.11 (1.33–3.36)</td>
<td>0.002</td>
</tr>
<tr>
<td><strong>Fibrosis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belfort (2006)</td>
<td>23</td>
<td>7/21</td>
<td>1.68 (0.53–5.37)</td>
<td>0.378</td>
</tr>
<tr>
<td>Aithal (2008)</td>
<td>22</td>
<td>6/30</td>
<td>1.62 (0.51–5.13)</td>
<td>0.417</td>
</tr>
<tr>
<td>Ratziu (2008)</td>
<td>30</td>
<td>5/31</td>
<td>0.96 (0.25–3.68)</td>
<td>0.957</td>
</tr>
<tr>
<td>Sanyal (2010)</td>
<td>25</td>
<td>26/83</td>
<td>1.69 (0.90–3.19)</td>
<td>0.102</td>
</tr>
<tr>
<td></td>
<td></td>
<td>44/165</td>
<td>1.57 (0.98–2.51)</td>
<td>0.060</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Summary</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7/21</td>
<td>1.68 (0.53–5.37)</td>
<td>0.378</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6/30</td>
<td>1.62 (0.51–5.13)</td>
<td>0.417</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5/31</td>
<td>0.96 (0.25–3.68)</td>
<td>0.957</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26/83</td>
<td>1.69 (0.90–3.19)</td>
<td>0.102</td>
</tr>
<tr>
<td></td>
<td></td>
<td>44/165</td>
<td>1.57 (0.98–2.51)</td>
<td>0.060</td>
</tr>
<tr>
<td><strong>Lobular inflammation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belfort (2006)</td>
<td>23</td>
<td>6/21</td>
<td>4.23 (1.36–13.20)</td>
<td>0.013</td>
</tr>
<tr>
<td>Aithal (2008)</td>
<td>22</td>
<td>8/30</td>
<td>2.20 (0.78–6.21)</td>
<td>0.136</td>
</tr>
<tr>
<td>Ratziu (2008)</td>
<td>30</td>
<td>11/31</td>
<td>1.79 (0.67–4.82)</td>
<td>0.248</td>
</tr>
<tr>
<td>Sanyal (2010)</td>
<td>25</td>
<td>29/83</td>
<td>2.72 (1.47–5.02)</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>54/165</td>
<td>2.58 (1.68–3.97)</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Summary</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6/21</td>
<td>4.23 (1.36–13.20)</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8/30</td>
<td>2.20 (0.78–6.21)</td>
<td>0.136</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11/31</td>
<td>1.79 (0.67–4.82)</td>
<td>0.248</td>
</tr>
<tr>
<td></td>
<td></td>
<td>29/83</td>
<td>2.72 (1.47–5.02)</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>54/165</td>
<td>2.58 (1.68–3.97)</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Steatosis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belfort (2006)</td>
<td>23</td>
<td>8/21</td>
<td>2.92 (0.94–9.14)</td>
<td>0.065</td>
</tr>
<tr>
<td>Aithal (2008)</td>
<td>22</td>
<td>11/30</td>
<td>1.60 (0.59–4.38)</td>
<td>0.359</td>
</tr>
<tr>
<td>Ratziu (2008)</td>
<td>30</td>
<td>5/31</td>
<td>4.04 (1.41–11.58)</td>
<td>0.009</td>
</tr>
<tr>
<td>Sanyal (2010)</td>
<td>25</td>
<td>26/83</td>
<td>4.43 (2.40–8.17)</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50/165</td>
<td>3.39 (2.19–5.25)</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Summary</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8/21</td>
<td>2.92 (0.94–9.14)</td>
<td>0.065</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11/30</td>
<td>1.60 (0.59–4.38)</td>
<td>0.359</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5/31</td>
<td>4.04 (1.41–11.58)</td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26/83</td>
<td>4.43 (2.40–8.17)</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50/165</td>
<td>3.39 (2.19–5.25)</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Management MEATLOAF

Make the diagnosis
Establish metabolic syndrome components
Assess lifestyle
Therapeutic approaches
Liver specific therapies
Offer clinical trials
  • Investigator-led studies
  • Commercial trials of novel agents or ‘repurposing’ of existing therapies
Advice and targets
Follow-up
Management MEATLOAF

**M**ake the diagnosis

**E**stablish metabolic syndrome components

**A**ssess lifestyle

**T**herapeutic approaches

**L**iver specific therapies

**O**ffer clinical trials

**A**dvice and targets

- Provide targets (if appropriate) to patient and primary care physician
  - Weight / waist circumference
  - BP,
  - cholesterol / triglyceride,
  - HbA1c

- Provide information leaflets

**F**ollow-up
Management MEATLOAF

M - Make the diagnosis
E - Establish metabolic syndrome components
A - Assess lifestyle
T - Therapeutic approaches
L - Liver specific therapies
O - Offer clinical trials
A - Advice and targets
F - Follow-up
  • 3–6 months if major therapeutic changes
  • 6 months if NASH/significant fibrosis/compensated cirrhosis
  • 6–12 months if stable on therapy
  • 12 months or discharge if simple steatosis or very low risk on non-invasive tests
RESEARCH

Piloting a multidisciplinary clinic for the management of non-alcoholic fatty liver disease: initial 5-year experience

Jeremy F L Cobbold, Sarrah Raveendran, Christopher M Peake, Quentin M Anstee, Michael S Yee, Mark R Thursz

Table 2  Change in variables from baseline to latest clinic visit for the total cohort

<table>
<thead>
<tr>
<th>Measure</th>
<th>N=</th>
<th>Baseline</th>
<th>Recent</th>
<th>Δ (%)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALT, U/l</td>
<td>180</td>
<td>61 (12–270)</td>
<td>50 (11–221)</td>
<td>-18</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Weight, kg</td>
<td>180</td>
<td>90.5 (42.7–175.0)</td>
<td>87.3 (45.9–175.3)</td>
<td>-3.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HbA1c, mmol/mol</td>
<td>121</td>
<td>46.5 (27–120)</td>
<td>45.4 (22–105)</td>
<td>-2.4</td>
<td>0.73</td>
</tr>
<tr>
<td>t chol, mmol/l</td>
<td>140</td>
<td>4.47 (2.30–7.95)</td>
<td>4.36 (2.01–7.12)</td>
<td>-2.5</td>
<td>0.001</td>
</tr>
<tr>
<td>HDL, mmol/l</td>
<td>140</td>
<td>1.09 (0.59–1.75)</td>
<td>1.08 (0.53–2.70)</td>
<td>-0.9</td>
<td>0.80</td>
</tr>
<tr>
<td>TG, mmol/l</td>
<td>140</td>
<td>1.83 (0.26–7.85)</td>
<td>1.67 (0.32–7.94)</td>
<td>-8.7</td>
<td>0.41</td>
</tr>
<tr>
<td>SBP, mm Hg</td>
<td>154</td>
<td>135 (98–191)</td>
<td>134 (100–176)</td>
<td>-0.4</td>
<td>0.36</td>
</tr>
<tr>
<td>DBP, mm Hg</td>
<td>154</td>
<td>82 (57–114)</td>
<td>82 (59–111)</td>
<td>0</td>
<td>0.64</td>
</tr>
</tbody>
</table>
Summary

• NASH is an increasing cause of liver mortality in HIV+/HIV-
• It is important to identify those at risk
• Lifestyle modifications are the key to management
• Vit E, Pioglitazone and Bariatric surgery may be used with caution
Acknowledgements

• Janice Main
• Graham Cooke
• Maud Lemoine
• Jeremy Cobbold
• Matthew Cowan
• Michael Yee