# Alcohol Use Disorders Identification Test (AUDIT)

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**Abstract**

## A Study on the Relationship between Alcohol Use Disorders Identification Test and Liver Function Test in Blue-Collar Workers

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**Objectives**: The purpose of this study was to investigate the usefulness of the Alcohol Use Disorders Identification Test (AUDIT) and the relationship between AUDIT score and liver function test.

**Methods**: AUDIT questionnaires were distributed to 440 blue-collar workers. We compared liver function test with firstly, normal and hazardous drinking as defined by WHO, and secondly, with normal, hazardous and harmful drinking as measured by Kim et al.(1999). We also compared influencing factors on abnormal liver function.

**Results**: By simple analysis in the normal BMI group, abnormal liver function was significantly affected by hazardous drinking (odds ratio 2.81) based on the guideline of WHO. By chi-square test for linear trend in the normal BMI group, abnormal liver function was significantly affected by hazardous drinking (odds ratio 1.23) and harmful drinking (odds ratio 2.14) based on the guideline of Kim et al.

By multiple logistic regression analysis, abnormal liver function was significantly affected by AUDIT questionnaires No. 1-3 (odds ratio- high risk 2.39), age (odds ratio- thirties 1.95, forties 2.40, fifties 3.85), BMI (odds ratio- overweight 1.66, obesity 4.53), guideline by WHO (odds ratio- hazardous drinking 2.10), and guideline by Kim et al (odds ratio- harmful drinking 2.20)

**Conclusions**: We found that the problem of alcohol drinking as measured by AUDIT was significantly associated with abnormal liver function. Therefore we suggest that AUDIT will be useful for the predictive test of abnormal liver function and screening test of hazardous and harmful drinking.

**Key Words**: AUDIT, Liver function test

MAST    CAGE

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,        ,

.      (1995)                                                                80%

12%,                10%,                    (Takagi    , 1986).

22%

95%

.

(1997)

.                                             SGOT (serum aspartate-aminotran-
sferase), SGPT (serum alanine-aminotrans-
MAST (Michigan    ferase),    GTP (serum gamma- glutamyltr-
Alcoholism Screening Test)    CAGE (4    ansferase)                                .
-    Have you ever felt you                                                                AUDIT
should Cut down your drinking?    Have    (Saunders    , 1993)                        ,
people Annoyed you by criticizing your                                                    AUDIT
drinking?    Have you ever felt or Guilt    .
about your drinking?    Have you ever had
a drink first thing in the morning to steady
your nerves to get rid of a hangover(Eye-
opener)?)

1.

(Adams    , 1996; Cherpitel, 1995).    2002    9        12                    1

6

(WHO)    Alcohol use disor-    500            AUDIT
ders identification test (AUDIT)    .        HBsAg            ,        6
(Babor    , 1989; Saunders    , 1993). AUDIT                                            ,
10                                                        ,                ,
3    (1-3        ),                3    (4-6                ,                ,
),    -                    4            60                    440
(7-10        )                        .

-    2.

.        Bohn        AUDIT            (2001)
(1995) Piccinelli    (1997) AUDIT                    (Table 1).
(1999)        AUDIT    8                            ,
85                    11            (1999)            12
AUDIT                            , 12        15        , 15                    ,

**Table 1.** Alcohol use disorders identification test (AUDIT)

| No. | Question | Score | | | | |
|-----|----------|---|---|---|---|---|
|     |          | 0 | 1 | 2 | 3 | 4 |
| 1.  | ? |   | 1 |   |   |   |
|     |   |   |   | 2-4 | 2-3 | 4 |
| 2.  | ? | 1-2 | 3-4 | 5-6 | 7-9 | 10 |
| 3.  | 6 |   |   | 1 | 1 |   |
|     | ? |   |   |   |   | 1 |
| 4.  | 1  , |   |   | 1 | 1 |   |
|     | ? |   |   |   |   | 1 |
| 5.  | 1  , |   |   | 1 | 1 |   |
|     | ? |   |   |   |   | 1 |
| 6.  | 1  , |   |   | 1 | 1 |   |
|     | ? |   |   |   |   | 1 |
| 7.  | 1  , |   |   | 1 | 1 |   |
|     | ? |   |   |   |   | 1 |
| 8.  | 1  , |   |   | 1 | 1 |   |
|     | ? |   |   |   |   | 1 |
| 9.  |   |   |   |   | 1 |   |
|     | ? |   | 1 |   | . |   |
| 10. | , |   |   |   |   |   |
|     | ,  '     ,   |   |   |   | 1 |   |
|     | ? |   | 1 |   | . |   |

, 

. SGOT 41 IU/L chi-square test for linear trend
, SGPT 36 IU/L , GTP .
63 IU/L SPSS Window 10.0 AUDIT
. (BMI : kg/m$^2$)
( , 2000) .
(18.5-22.9), (23.0-24.9) AUDIT (No. 1-
(25 ) . 3) 7 ,
; (No. 4-6)
(Robinson , 1989; Bellentani , 7 , ; -
1994) ( , (No. 7-10) 9
, ) , ,
AUDIT ,
EpiInfo version 6 , AUDIT No. 1-3
p , , , AUDIT
, (1999) No. 4-6 No. 7-10
AUDIT category . AUDIT ,

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**Table 2.** General characteristics of study subjects

| Characteristics | Group | N(%)/Mean± S.D. |
|---|---|---|
| Sex | Male | 440(100) |
| Age | ~29 | 176(40.0) |
| | 30~39 | 139(31.5) |
| | 40~49 | 79(18.0) |
| | 50~ | 46(10.5) |
| AUDIT Score | | 9.97± 6.10 |
| AUDIT 1 | Normal drinking | 166(37.7) |
| | Hazardous drinking | 274(62.3) |
| AUDIT 2[†] | Normal drinking | 286(65.0) |
| | Hazardous drinking | 52(11.8) |
| | Harmful drinking | 102(23.2) |
| BMI[‡] | Normal | 213(48.4) |
| | Overweight | 111(25.2) |
| | Obesity | 116(26.4) |

AUDIT 1 - Guideline for normal and hazardous alcohol use, as defined by WHO

[†] AUDIT 2 - Guideline for normal, hazardous and harmful alcohol use, as defined by Kim et al.(1999)

[‡] Body mass index (kg/m²)

,                                                                          2. 81
                                                (p=0. 012).            (1999)
          (1999)        A U DIT                                    ,      ,
                    .                                        115  (83. 9%),  17  (81. 0%),  39
                                        (70. 9%)                                ,
                                          ,                        22  (16. 1%),   4
                                      (19. 0%),  16  (29. 1%)

            440                20      176
(40. 0%),   30      139  (31. 5%),  40      79      1. 23,  2. 14
(18. 0%),  50        46  (10. 5%)      . 440      (p=0. 044).
   A U DIT            9. 97          ,
                A U DIT                166
(37. 7%),        274  (62. 3 %)          ,                    33  (76. 7%),  43  (63. 2%)
   (1999)                    A U DIT                                                10
      286  (65. 0%),        52  (11. 8%),   (23. 3%),  25  (36. 8%)
      102  (23. 2%)                  .                                      1. 92
        213  (48. 4%),          111                  (p=0. 136).
(25. 2%),      116  (26. 4%)    (Table 2).    (1999)                                ,
                                                  ,                        52  (72. 2%),  9
                                              (75. 0%),  15  (55. 6%)
   68  (89. 5%),  103  (75. 2%)                      ,       ,            20  (27. 8%),  3
                                      8       (25. 0%),  12  (44. 4%)
(10. 5%),  34  (24. 8%)                                          ,

**Table 3.** Comparison of liver function test by AUDIT 1 and AUDIT 2

| BMI | | | Liver function test | | Total | p-value | Odds ratio | 95% C.I. |
|---|---|---|---|---|---|---|---|---|
| | | | normal(%) | abnormal(%) | | | | |
| Normal | AUDIT 1[†] | Normal drinking | 68(89.5) | 8(10.5) | 76 | 0.012 | 1.00 | - |
| | | Hazardous drinking | 103(75.2) | 34(24.8) | 137 | | 2.81 | 1.16-7.03 |
| | AUDIT 2[‡] | Normal drinking | 115(83.9) | 22(16.1) | 137 | 0.044 | 1.00 | - |
| | | Hazardous drinking | 17(81.0) | 4(19.0) | 21 | | 1.23 | 0.38-4.01 |
| | | Harmful drinking | 39(70.9) | 16(29.1) | 55 | | 2.14 | 1.02-4.49 |
| Overweight | AUDIT 1 | Normal drinking | 33(76.7) | 10(23.3) | 43 | 0.136 | 1.00 | - |
| | | Hazardous drinking | 43(63.2) | 25(36.8) | 68 | | 1.92 | 0.75-4.98 |
| | AUDIT 2 | Normal drinking | 52(72.2) | 20(27.8) | 72 | 0.140 | 1.00 | - |
| | | Hazardous drinking | 9(75.0) | 3(25.0) | 12 | | 0.87 | 0.21-3.53 |
| | | Harmful drinking | 15(55.6) | 12(44.4) | 27 | | 2.08 | 0.83-5.21 |
| Obesity | AUDIT 1 | Normal drinking | 26(55.3) | 21(44.7) | 47 | 0.159 | 1.00 | - |
| | | Hazardous drinking | 29(42.0) | 40(58.0) | 69 | | 1.71 | 0.76-3.87 |
| | AUDIT 2 | Normal drinking | 42(54.5) | 35(45.5) | 77 | 0.094 | 1.00 | - |
| | | Hazardous drinking | 5(26.3) | 14(73.7) | 19 | | 3.36 | 1.10-10.3 |
| | | Harmful drinking | 8(40.0) | 12(60.0) | 20 | | 1.80 | 0.66-4.90 |

Chi-square for linear trend

[†] AUDIT 1 - Guideline for normal and hazardous alcohol use by WHO

[‡] AUDIT 2 - Guideline for normal, hazardous and harmful alcohol use by Kim et al.(1999)

Body mass index (kg/ )

0. 87, 2. 08
(p=0. 140).


  26 (55. 3%), 29 (42. 0%)
                                    21
(44. 7%), 40 (58. 0%)
                          1. 71
                  (p=0. 159).
(1999)                                    ,
 ,                      42 (54. 5%), 5
(26. 3%), 8 (40. 0%)
          ,     ,               35 (45. 5%),
14 (73. 7%), 12 (60. 0%)

               ,
3. 36, 1. 80
(p=0. 094)(Table 3).

**Table 4.** Result of partial correlation analysis adjusted for body mass index

| | AUDIT score | p-value |
|---|---|---|
| SGOT | 0.114 | 0.017 |
| SGPT | 0.068 | 0.157 |
| GTP | 0.234 | 0.000 |

AUDIT
AUDIT
SGOT, SGPT, GTP                0. 114,
0. 068, 0. 234 SGOT, GTP
        SGPT
(Table 4).

                                          .

                                          ,
                          20

drinking)                      ,           ,

.                              1. 65-

1. 69

4. 28- 4. 55                                                    4 (DSM- )

.                              (Abuse)                    .

2. 39                                      AUDIT     8

(p=0. 000).                                        (Saunders  , 1993).

1. 51

(p=0. 593).    -

1. 50                              ,

(p=0. 437).                          .                              (1999)

2. 10

(p=0. 002).                  AUDIT            12                    , 12

(1999)                              15                    , 15

,                              1. 79, 2. 20                    .                    ,      ,

(p=0. 003)(Table 5).                                                  ,

,

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,                                        ,

,

( , 1995)                        (Robinson  , 1989; Bellentani  ,

.                        1994)                    .

AUDIT

.                              SGOT  SGPT,

4 (DSM- )          GTP                    0. 114, 0. 068, 0. 234

(Dependence)          (Abuse)          SGOT,  GTP

, Piccinelli  (1997)          SGPT                              .

(Hazardous drinking)                Bohn  (1995)          65

,      ,          187                    AUDIT

(SGOT,  SGPT,  GTP)

0. 43,  0. 39,  0. 31

1          21          ( 1                                        .

3          1          7     ),                    AUDIT

1          14          ( 1                    3                              .

1          5     )                                        AUDIT

.          10   No. 1- 3(          ),    ,

(ICD- 10)                    (Harmful                                        3

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**Table 5.** Multiple logistic regression analysis of variables on abnormal liver function tests
(SGOT 41 IU/L or SGPT 36 IU/L or GTP 63 IU/L)

| Variables | Category | p-value | Odds ratio | 95% C.I. |
|---|---|---|---|---|
| AUDIT Question | No.1-3 (Drink amount) | | | |
| | low risk | | 1.00 | - |
| | high risk | 0.000 | 2.39 | 1.51-3.78 |
| Age (year) | ~29 | | 1.00 | - |
| | 30~39 | 0.015 | 1.95 | 1.14-3.35 |
| | 40~49 | 0.006 | 2.40 | 1.29-4.49 |
| | 50~ | 0.000 | 3.85 | 1.82-8.12 |
| BMI[†] | Normal | | 1.00 | - |
| | Overweight | 0.071 | 1.66 | 0.96-2.87 |
| | Obesity | 0.000 | 4.53 | 2.68-7.65 |
| AUDIT Question | No.4-6 (Drinking behavior) | | | |
| | low risk | | 1.00 | - |
| | high risk | 0.593 | 1.51 | 0.33-6.89 |
| Age (year) | ~29 | | 1.00 | - |
| | 30~39 | 0.021 | 1.87 | 1.10-3.19 |
| | 40~49 | 0.009 | 2.26 | 1.22-4.17 |
| | 50~ | 0.002 | 3.05 | 1.49-6.25 |
| BMI | Normal | | 1.00 | - |
| | Overweight | 0.070 | 1.65 | 0.96-2.83 |
| | Obesity | 0.000 | 4.28 | 2.56-7.15 |
| AUDIT Question | No.7-10 (Psychosocial problem) | | | |
| | low risk | | 1.00 | - |
| | high risk | 0.437 | 1.50 | 0.54-4.21 |
| Age (year) | ~29 | | 1.00 | - |
| | 30~39 | 0.024 | 1.85 | 1.08-3.16 |
| | 40~49 | 0.011 | 2.23 | 1.21-4.13 |
| | 50~ | 0.002 | 3.07 | 1.49-6.29 |
| BMI | Normal | | 1.00 | - |
| | Overweight | 0.064 | 1.67 | 0.97-2.87 |
| | Obesity | 0.000 | 4.30 | 2.57-7.18 |
| AUDIT 1[‡] | Normal drinking | | 1.00 | - |
| | Hazardous drinking | 0.002 | 2.10 | 1.32-3.35 |
| Age (year) | ~29 | | 1.00 | - |
| | 30~39 | 0.019 | 1.90 | 1.11-3.25 |
| | 40~49 | 0.011 | 2.24 | 1.20-4.18 |
| | 50~ | 0.002 | 3.13 | 1.52-6.45 |
| BMI | Normal | | 1.00 | - |
| | Overweight | 0.058 | 1.69 | 0.98-2.93 |
| | Obesity | 0.000 | 4.55 | 2.70-7.67 |

**Table 5.** Continue

| Variables | Category | p-value | Odds ratio | 95% C.I. |
|---|---|---|---|---|
| AUDIT 2 | Normal drinking | | 1.00 | - |
| | Hazardous drinking | 0.085 | 1.79 | 0.92-3.47 |
| | Harmful drinking | 0.003 | 2.20 | 1.31-3.68 |
| Age (year) | ~29 | | 1.00 | - |
| | 30~39 | 0.014 | 1.96 | 1.14-3.35 |
| | 40~49 | 0.011 | 2.24 | 1.20-4.18 |
| | 50~ | 0.001 | 3.38 | 1.63-7.02 |
| BMI | Normal | | 1.00 | - |
| | Overweight | 0.069 | 1.66 | 0.96-2.87 |
| | Obesity | 0.000 | 4.51 | 2.67-7.61 |

Confidence interval

[†] Body mass index(kg/m²)

[‡] AUDIT 1 - Guideline for normal and hazardous alcohol use by WHO

AUDIT 2 - Guideline for normal, hazardous and harmful alcohol use by Kim et al.(1999)


AUDIT No. 4-6( ) No. 7-
10( - )
AUDIT .
AUDIT No. 4-6
No. 7-10
. AUDIT
:
(2001)
360 AUDIT
AUDIT
270 g AUDIT
. .
(1999) : 440 AUDIT
,
. (1999) , ,
.
, .
, :
MAST, CAGE ,
, AUDIT 2.81
, (1999)
, . , ,
AUDIT chi-square test for linear trend

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,                              1. 23, 2. 14

                        .

                    AUDIT

No. 1-3(          - 2. 39),      (30  -1. 95, 40  -
2. 40, 50  -3. 85),          (      - 1. 66,      -
4. 53),            (          - 2. 10),
      (          - 2. 20)

          .

    : AUDIT

            AUDIT

          .

      ,      ,      ,      ,      .
    Alcohol Use Disorders Identification Test
                        .            2001;
34( 3) : 277- 83.

      ,      ,      ,      ,      ,      .
    Alcohol use disorders identification test
(AUDIT)                        .
1999; 20( 9) : 1152- 9.

          .            .
            .                  2000; 42- 54.
          .        .      :        , 1995.
            . 1997.
            .                  :
, 2000.
      ,      ,      ,      .
                        .            2001;
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