

A randomised controlled trial of brief intervention strategies in patients with alcohol related facial injury

Glasgow University School of Dentistry:

Principal Investigators:

Ashraf F. Ayoub, Professor of Oral & Maxillofacial Surgery

Alex Crawford, Chief Executive, RCA Trust

Gail Gilchrist, Research Manager, Addictions Team, Greater Glasgow NHS Board

Ian Smith, Consultant Psychiatrist, Gartnavel Royal Hospital, Greater Glasgow Primary Care NHS Trust

Adrian Bowman, Professor, Dept. of Statistics, University of Glasgow

Collaborators:

Alan Russell, Specialist Registrar in General Psychiatry, Gartnavel Royal Hospital, Greater Glasgow Primary Care NHS Trust

Fiona Oakey, Alcohol research nurse, Glasgow Royal Infirmary

Christine Goodall, Clinical Lecturer (Hon SpR) in Oral Surgery, Glasgow University Dental School

Ian Holland, Consultant Oral & Maxillofacial Surgeon at Falkirk Royal Infirmary

David Koppel, Consultant Oral & Maxillofacial/Craniofacial Surgeon, Southern General Hospital

Colin Bennie, Forth Valley Health Board

Noel Thompson, Dept. of Statistics, The University of Glasgow

BACKGROUND

There is a complex relationship between alcohol and violence.¹ Violent offenders are more likely to be heavy drinkers than demographically matched samples of the general population.² The British Crime Survey 2000 revealed that in 53% of all incidents of violence the victim described the perpetrator as being under the influence of alcohol, and the corresponding figure for acquaintance violence was 36%.³ Alcohol related violence has a considerable impact on Accident and Emergency and Maxillofacial Units.⁴⁻⁹ It has been found that alcohol has been associated with 11% of falls and that 20% of facial injuries took place within four hours of alcohol consumption.¹⁰ Others have noted that maxillofacial injury units may be particularly

appropriate for alcohol interventions for patients with facial injuries¹¹.

PILOT STUDIES

Pilot Study 1:

Strathclyde Police 'K' Division carried out an assessment of all the arrests during January and February 2001. It was quite clear that facial injuries involving the use of weapons were associated with alcohol.¹²

Pilot Study 2:

Between January and May 2001, 109 consecutive patients who attended the West of Scotland Oral & Maxillofacial Surgery service with facial injuries were screened to investigate the link between alcohol and facial trauma. The investigation proved that 79% of facial injuries were sustained in assaults and 85% of patients sustained their injuries while drinking at a hazardous level. Facial injury was a recurrent phenomenon in 33% of cases.¹³

AIM OF THE STUDY

The purpose of this investigation was to explore the possibility of introducing a brief motivational intervention package for alcohol misuse into the Oral and Maxillofacial Outpatient Clinic and to assess the outcome of the nurse-led intervention in changing the alcohol intake of facial injury patients attending this service in the West of Scotland.

Main Objectives of the Study:

1. Assess the characteristics of patients with alcohol related facial injuries in terms of demographics, drinking history and previous facial injuries.
2. Compare two different methods of brief intervention.
3. Evaluate sex differences of patient entry characteristics and response to treatment.
4. Assess the predictors of successful intervention.

MATERIALS & METHODS

This investigation was conducted on consecutive patients who were referred to three sites of the West of Scotland Oral & Maxillofacial Surgery Services i.e. the Southern General Hospital Glasgow, Falkirk Royal Infirmary and Stirling Royal Infirmary, for assessment and management of their facial trauma within two weeks of the injury. Data were collected in 3 waves i.e. after initial intervention, and at 3 and 12 months post intervention. All data were collected between March 2003 and July 2005.

The Alcohol Use Disorders Identification Test (AUDIT)¹⁴ was used to select participants. Those with a score of 8 or over (i.e. hazardous drinkers) were included in the study. Participants were interviewed by a nurse who recorded demographic data which included age, sex, occupation, ethnicity, marital status, the cause and where the injury took place, in addition, the following four measurements were recorded for each case:

- a. Number of drinking days per week
- b. Number of abstinent days per week
- c. Number of standard drinks per drinking day
- d. Number of heavy drinks per drinking day

Patients were randomly allocated to one of two brief interventions; these were either a motivational interview by a trained nurse or providing an information leaflet on alcohol use and its effects. The randomisation protocol was computer generated by a member of the research team who was not involved in data recording (AB). Following initial assessment the interview nurse opened consecutive sealed envelopes indicating intervention. The interview nurse was blind to the treatment intervention. The motivational interview package was modified, with permission, from the Addiction Research Foundation, Toronto and the leaflet was supplied by Greater Glasgow NHS Board. Two designated research nurses were trained by a team member (AC) to carry out a brief psychological intervention by face-to-face interview or by telephone. They received continuous support and supervision from an expert (AR) in brief motivational intervention to maintain the quality and consistency of this intervention.

Each patient was invited for review at 3 and 12 months following the initial intervention to assess the change in drinking behaviour. At follow-up patients received a written invitation to attend for interview. Those who did not attend were contacted a maximum of 3 times.

RESULTS

RESPONSE RATES

In total 538 patients attended clinics at times when the research nurse was present and were considered for inclusion in the study. 58 patients (46 male and 12 female) refused to participate in the study for the reasons shown on the graph below (Figure 1); the most commonly given reasons were lack of interest and lack of time. A number of other patients stated that they were too distressed or in pain. A further 231 patients were excluded prior to screening, most commonly because their injury was more than 2 weeks old (165 patients) but other reasons for

exclusion included inability to speak English or aggressive behaviour in the clinic. 249 patients (217 male and 32 female) underwent initial screening, 195 patients, (177 male and 18 female), who scored 8 or above on AUDIT were randomised to leaflet or motivational interview groups. Hence the initial response rate was 78.3%

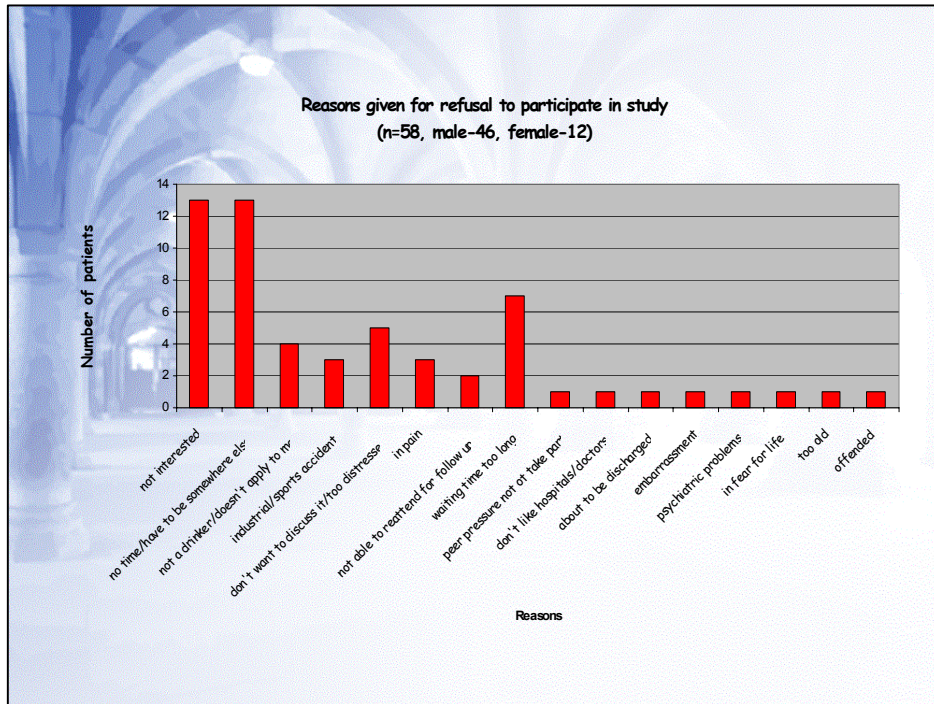


Figure 1: The reasons given for refusal to participate in the study

About 53% of the patients returned for follow-up at 3 months, and 69% returned at 12 months. There was a significant association between distance from hospital and likelihood of return in person at 3 months but not at 12 months. The increase in financial incentives between the two time periods may have been justified to cover patient travelling expenses to hospital, this may have contributed to the increase in return rate at 12 months.

BASELINE MEASURES

Demographic details

The age range of participants was 16 to 77 with a median of 29 years. 118 (60.5%) patients were in employment (111 male and 7 female) and most male participants were single (114 patients). The majority of patients had Carstairs Deprivation Category scores between 4 and 6¹⁵. These

scores range between 1 (most affluent areas) – 7 (most deprived areas) ¹⁶.

Assault details, previous assault history and alcohol use

Alleged assault was the main mechanism of injury reported by 72% of the patients. Among males, most of these acts of interpersonal violence took place in public places, either in the street (55%) or in a pub or disco (13.3%). In the female group, 55.5% of injuries happened at home, possibly as a result of domestic violence. 44.3% of patients required surgical intervention for their injury.

24.6% of patients had sustained previous alcohol related facial injuries. 82.9% of these cases had consumed more than 8 units of alcohol at the time of their latest injury and the majority of injuries were due to alleged assault (Figure 2). This is consistent with the findings in our earlier pilot study. There was no statistically significant association between whether or not the patient had a previous alcohol related facial injury and reporting ‘assault’ as the cause of the current injury.

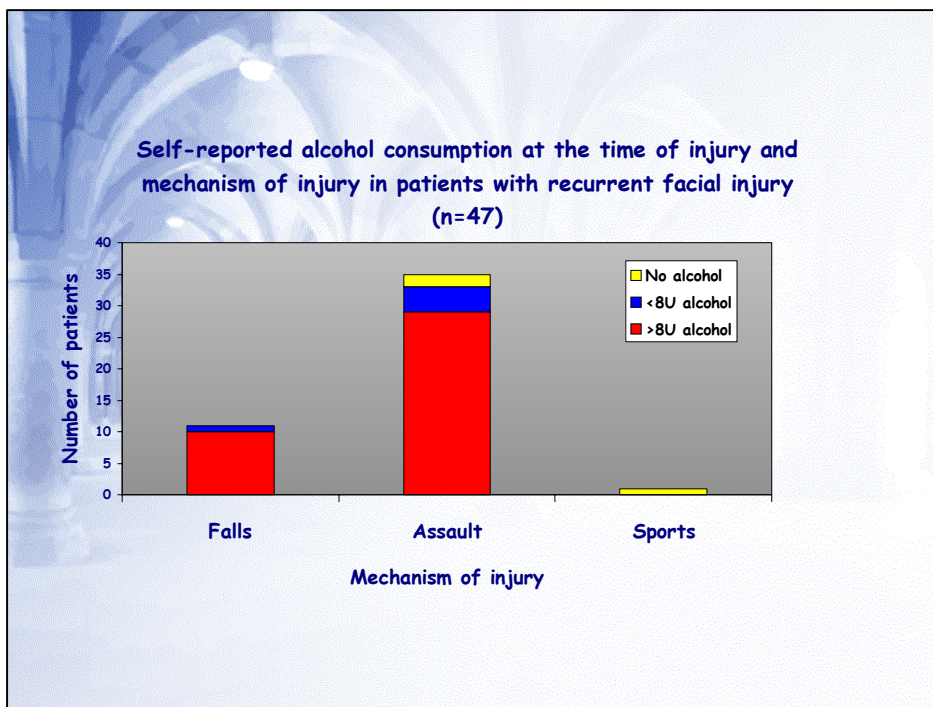


Figure 2: illustrates the cause and alcohol consumption in cases with recurrent injuries

83.6% (163) of patients had been drinking at the time of injury, of those who had been drinking, 82.8% had consumed more than 8 units at the time of injury which could be classed as binge drinking. There was no statistically significant association to suggest that those patients who had

recurrent injuries were more likely to be drinking more or less than 8 units at the time of injury, however this was very close to significance ($p = 0.051$), and may actually be clinically significant.

AUDIT Scores

AUDIT scores for participants ranged from 8 to 40 with a median 15 and mean of 16.7. 26.6% of patients scored over 20 and could be considered to be possibly alcohol dependent¹⁴, 17.9% were harmful drinkers scoring between 16 and 19, and the rest (55.4%) were hazardous drinkers scoring above 8 but less than 15. The mean AUDIT score for patients with recurrent injuries was 21.6, compared with 15.2 for those patients with no previous alcohol related facial injury. The difference between the population mean of these two groups was statistically significant ($p = 0.00003$) This suggests that patients with recurrent alcohol related facial injuries are more likely to have higher AUDIT scores.

Allocation to intervention groups

88 male and 10 female patients were randomly assigned to the leaflet group and 89 male and 7 female patients were randomly assigned to the motivational interview group. There was no significant difference in terms of number of patients or gender between the groups. Nor were there any significant differences between the two groups in terms of living status, Carstairs Deprivation Category, mechanism of injury, location of injury, severity of injury, recurrent injury or whether surgical intervention was required, or in AUDIT scores.

Despite the fact that cases were randomly allocated to motivational interview or leaflet groups, statistically significant differences were detected between the two groups at baseline in terms of the outcome measures (number of drinking days, number of the abstinent days, number of standard drinks per day, number of heavy drinks per day) with more heavy drinking individuals allocated to the motivational intervention group. Therefore, to adjust for the initial imbalance between the two groups, the outcome measures were analysed in a statistical model using the initial AUDIT score as covariate. An analysis of covariance model was fitted to the data allowing the change in the outcome measures between time points to be considered. This accounts for any difference between the groups at recruitment but also allows differences in behaviour at different drinking levels to be identified. An interaction term was fitted to allow for the possibility that the difference in response between the two groups could vary depending on the AUDIT value recorded at recruitment.

Intervention Time:

The median intervention time for the motivational interview group was 25 minutes and for the leaflet group was 5 minutes. Motivational interventions can be carried out in the Oral and Maxillofacial outpatient setting without significantly impacting on the running of the clinic.

CHANGE SCORES

There were only a few females in the study, so statistical analyses were restricted to males only.

Results At Three Months:

Using initial recruitment AUDIT scores as covariate, there was no statistically significant difference between the two groups in terms of the four outcome measures (Figure 3).

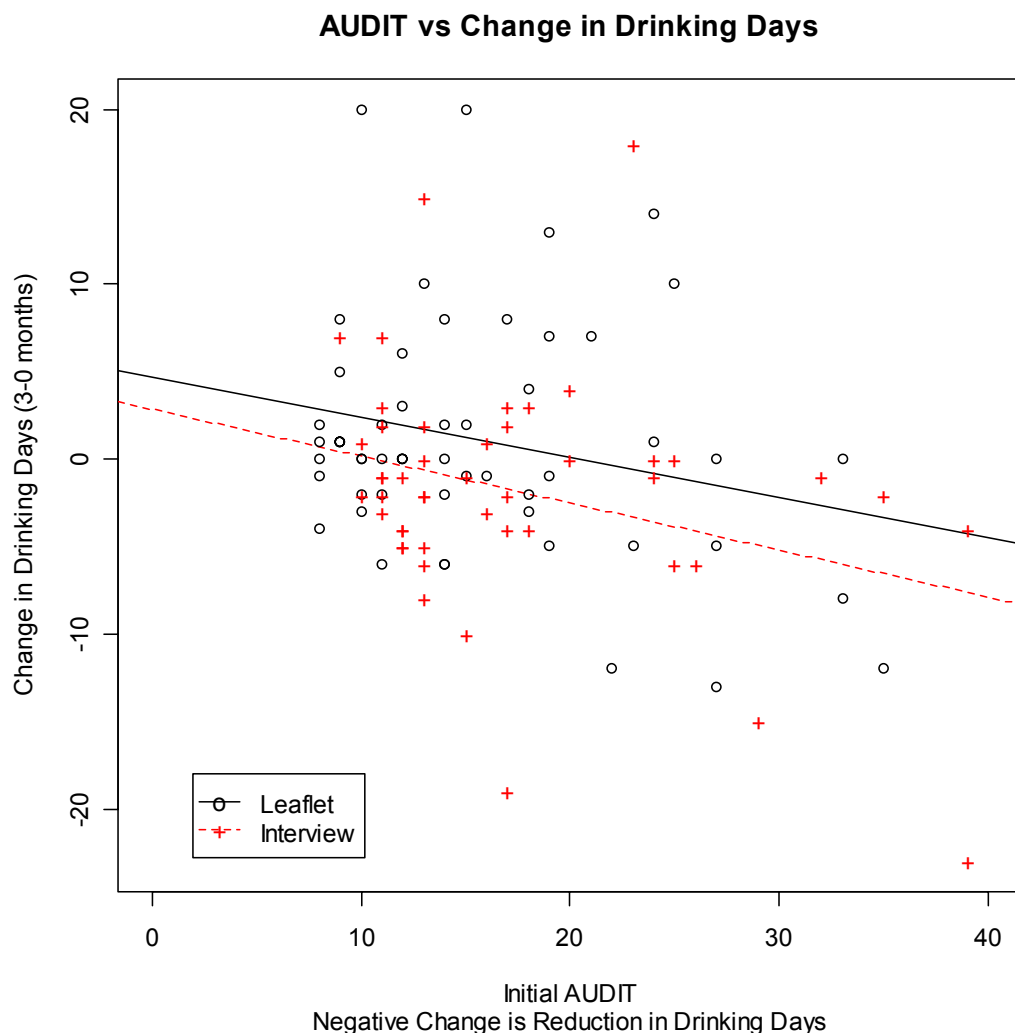


Figure 3: Differences in drinking days between the two groups at 3 month using AUDIT as a Covariate

RESULTS AT TWELVE MONTHS

Using initial recruitment AUDIT scores as a covariate, there was a statistically significant interaction between the change in the number of drinking days, AUDIT scores and group at 12 months (Figure 4). This provides evidence to suggest that those patients who have the highest AUDIT scores at recruitment, on average, demonstrate a reduction in drinking days which is statistically significantly greater than those patients in the leaflet group who had the same initial AUDIT score. These conclusions apply for outcome measures at 12 months (drinking days ($p=0.007$), abstinent days ($p=0.02$), heavy drinking days ($p=0.03$) but not for standard drinks per drinking day ($p=0.2$))

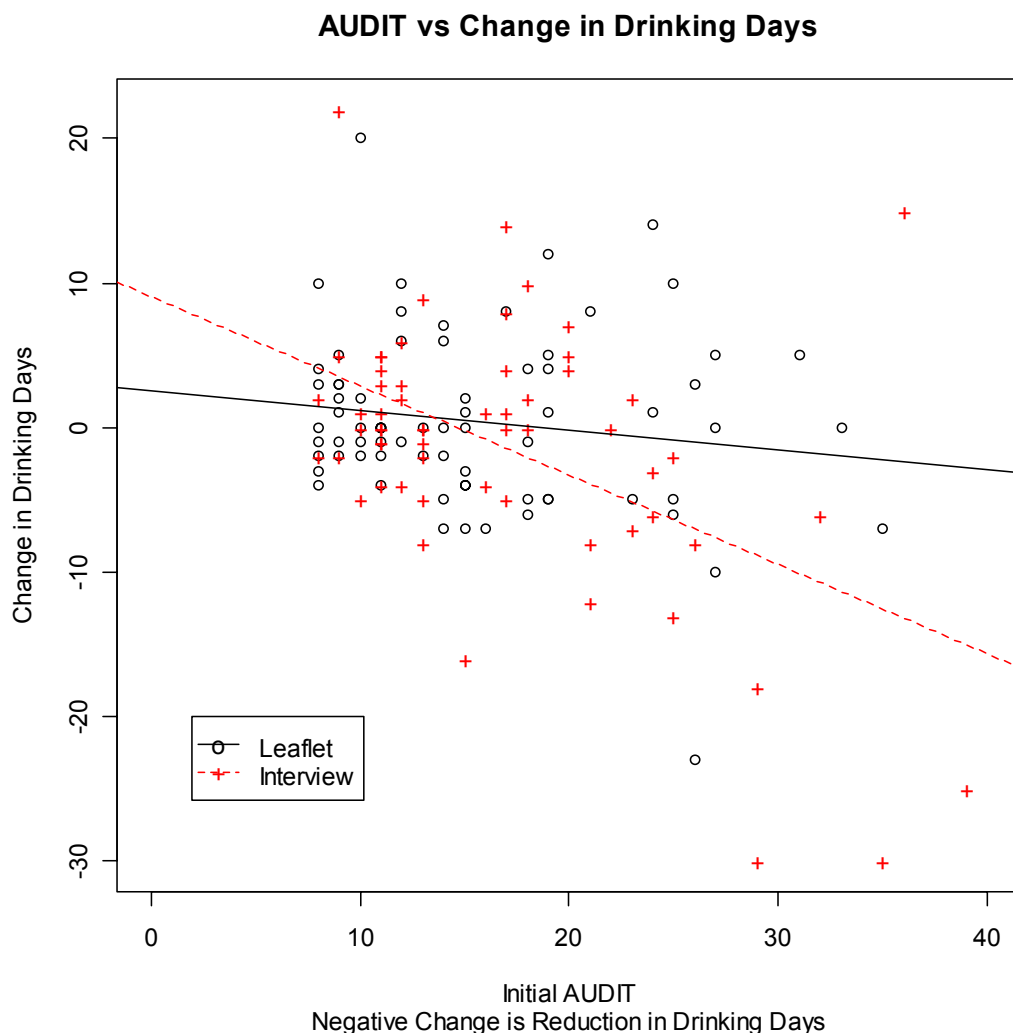


Figure 4: Differences in reduction of drinking days between the two groups at 12 month using AUDIT as a Covariate

After removal of females the change in drinking days remains significant ($p=0.03$), however, the change in heavy drinking days becomes non-significant ($p=0.07$) indicating some sensitivity to the presence of females within the sample.

We have also investigated other covariates including age, sex, mechanism of injury, severity of injury, the time between injury and intervention, the need for active treatment, the Carstairs Deprivation Category, mechanism of injury, and PTSD. None of these played a significant role in affecting the outcome measures between the two groups.

Covariant effects

AUDIT score was not seen to affect the follow-up rate at either 3 or 12 months. Likewise, none of the following variables affected the results: gender, Carstairs Deprivation Category, severity of injury, requirement for treatment, interview mode, payment level, group assignment or distance from home to hospital. The only variable found to affect the likelihood of return at 12 months but not at 3 months was age; more patients of the younger age group returned.

SUMMARY OF KEY FINDINGS

1. It is possible to operate nurse led motivational interventions in a busy oral & maxillofacial out-patient consultant clinic.
2. 78.3% of the patients recruited for the study scored 8 or above in AUDIT i.e. were hazardous drinkers.
3. One quarter of this group of patients had previous alcohol related facial injuries. These patients were significantly more likely to have higher AUDIT scores than those with a first injury.
4. Only a small proportion of patients were female. Because of this statistical analyses were conducted for males only.
5. Despite the random allocation of patients to either leaflet or interview groups, there was an imbalance between the two groups with respect to the drinking variables at baseline this was

one of the problems with this investigation. This was adjusted for statistically during analyses.

6. This investigation confirmed that the motivational interview produced a significant reduction in the drinking days when compared to the leaflet method of intervention in patients with high initial AUDIT scores at twelve months following recruitment. This change was not seen for patients with low to moderate AUDIT scores.
7. No statistically significant differences in outcome measures were detected between the two groups at three months post intervention. This is an interesting finding which, is in accordance with previous published data by Smith et al from Cardiff, who showed no change in drinking behaviour in control or treatment groups at three months but a positive affect of the intervention in terms of reduction in drinking behaviour at twelve month.
8. Researchers were able to collect data from 69% of the patients at the twelve months follow-up interval. The only variable seen to affect this was age with younger patients more likely to return for the twelve month assessment. Additionally, distance from hospital adversely affected follow up in person at 3 months but not at 12 months, which we attribute to the increase in financial incentive between the two periods.
9. There is a considerable debate regarding the appropriateness of using AUDIT score as an entry criterion for provision of brief intervention. This resulted in the exclusion of 5 patients who had been binge drinking at the time of injury because their AUDIT scores were below the threshold and further excluded 8 patients who had been drinking at lower levels
10. 24.9% of the patients had previous alcohol related facial injuries. Treatment of these patients has significant financial implications for National Health Service resources.
11. Response rates at follow-up are influenced by the level of reward offered to participants.
12. 83.6% of patients were drinking at the time of injury. Of those 82.8% had consumed more than 8 units of alcohol. There was borderline statistical significance ($p = 0.051$) suggesting that those patients with recurrent injuries were most likely to have drunk more than 8 units prior to the current injury. This suggests that these are a high risk group that might require specific interventions.

AREAS FOR FUTURE INVESTIGATION

1. We intend to investigate gender differences among patients attending maxillofacial injury units. Our data indicates that most of the small sample of women in the study may have been the victims of domestic violence. This raises questions about the impact of a treatment intervention in which the victim is returning to a potentially violent situation.
2. We shall consider the utility of matching treatment modalities to clients. A substantial minority of patients recorded very high AUDIT scores, which raises questions about the utility of a brief intervention.
3. We feel that a future investigation should record more fully the precise circumstances of any alleged assault and should attempt to elucidate more fully the roles of angry and aggressive behaviour and alcohol in precipitating the injury.

References:

1. DEEHAN, A. (1999) Alcohol and Crime: Taking stock (London, Home Office, Policing and Reducing Crime Unit).
2. WELTE, J. W. & MILLER, B. A. (1987) Alcohol use by violent and property offenders, *Drug Alcohol Depend*, 19, 313-24.
3. MATTINSON, J. (2001) Stranger and acquaintance violence: practice messages from the British Crime Survey. Briefing Note 7/01 (London, Home Office, Research, Development and Statistics Directorate).
4. FOTHERGILL, N. J. & HASHEMI, K. (1990) A prospective study of assault victims attending a suburban A&E department, *Arch Emerg Med*, 7, 172-7.
5. HUSSAIN, K., WIJETUNGE, D. B., GRUBNIC, S. & JACKSON, I. T. (1994) A comprehensive analysis of craniofacial trauma, *J Trauma*, 36, 34-47.
6. ALEXANDRE, P. K., ROEBUCK, M. C., FRENCH, M. T., CHITWOOD, D. D. & MCCOY, C. B.

(2001) Problem drinking, health services utilization, and the cost of medical care, *Recent Dev Alcohol*, 15, 285-98.

7. CEMBROWICZ, S. P. & SHEPHERD, J. P. (1992) Violence in the Accident and Emergency Department, *Med Sci Law*, 32, 118-22.

8. PIRMOHAMED, M., BROWN, C., OWENS, L. et al. (2000) The burden of alcohol misuse on an inner-city general hospital, *Qjm*, 93, 291-5.

9. RAINER, T. H., SWANN, I. J. & CRAWFORD, R. (1996) Critical analysis of an accident and emergency ward, *J Accid Emerg Med*, 13, 325-9.

10. MAGENNIS P, S. J., HUTCHISON I & BROWN A (1998) Trends in facial injury, *BMJ*, 316, 325-326.

11. SMITH, A. J., HODGSON, R. J., BRIDGEMAN, K. & SHEPHERD, J. P. (2003)
A randomized controlled trial of a brief intervention after alcohol-related facial injury.
ADDICTION 98 (1), 43-52.

12. PEARSON, R. (2001) Data note: serious assaults in Renfrewshire January and February 2001 (Paisley, Strathclyde Police, 'K' Division, Community Involvement Branch).

13. OAKLEY, F., AYOUB, A., CRAWFORD, A. et al. (2001) Alcohol abuse among patients with facial injuries, University of Paisley, Paisley.

14. BABOR TF, de la Fuente JR, John Saunders J & Grant M (1992). AUDIT: The Alcohol Use Disorders Identification Test: Guidelines for use in Primary Health Care. WHO: Geneva.

15 CARSTAIRS, V.; Morris, R. Deprivation and health in Scotland. Aberdeen: Aberdeen University Press; 1992.

16 McLOONE P (2004). Carstairs scores for Scottish postcode sectors from the 2001 Census. MRC Social & Public Health Sciences Unit, University of Glasgow, Glasgow.