High prevalence of alcohol use disorders in patients with inflammatory skin diseases

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Abstract

Background: There is a known association between psoriasis and heavy alcohol consumption. Causality remains unclear with evidence supporting both alcohol triggering psoriasis and psoriasis predisposing to heavy alcohol consumption. However, the association between heavy alcohol consumption and other inflammatory skin diseases remains to be defined.

Objective: To examine the prevalence of heavy drinking using the Alcohol Use Disorders Identification Test (AUDIT) in patients with inflammatory skin disease.

Methods: We conducted an observational cross sectional study in a single hospital out-patient department. We recruited 609 patients in 5 groups; psoriasis, eczema, cutaneous lupus (lupus), other inflammatory disorders and a reference population with skin lesions. The primary outcome was the proportion of patients in each group with an alcohol use disorder (AUD).

Results: Observed prevalence of AUD was: psoriasis (30.6%), eczema (33.3%), cutaneous lupus (12.3%), other inflammatory disease (21.8%) and non-inflammatory disease (14.3%). Odds ratios (OR) (95% CI) for AUDs in inflammatory groups compared with non-inflammatory, adjusted for age and gender were: psoriasis 1.65 (0.86-3.17), eczema 2.00 (1.03-3.85), lupus 1.03 (0.39-2.71), other inflammatory 1.32 (0.68-2.56). OR were reduced if also adjusted for DLQI. The prevalence of DLQI of ≥11 was: psoriasis 31.1%, eczema 43.7%, cutaneous lupus 17.5%, other inflammatory 17.2% and non-inflammatory 2.8%.

Conclusions: Patients with eczema attending a single site hospital clinic have been shown to have high levels of alcohol use disorders of a similar level to patients with psoriasis and higher than patients with non-inflammatory skin diseases. The role of alcohol in the exacerbation of eczema needs further investigation. Caution and a full alcohol history is recommended when treating eczema patients with potentially hepatotoxic medication. By identifying heavier drinking patients we may be able to support them with interventions to reduce alcohol intake and potentially improve their skin disease.

What's already known about this topic?

A proportion of patients with psoriasis are known to be heavy drinkers consuming higher than recommended safe levels of alcohol, recently defined by the NHS as 14 units for men and women [1]. Whether their alcohol behaviour is a cause or consequence of their skin disease is not known although many patients report disease flares following excess drinking. Alcohol consumption can have a serious impact during systemic drug treatment.

What does this study add?

We have shown that the level of alcohol use disorders in patients with eczema are as high as in psoriasis. This surprising finding has major implications for the clinic. We recommend that eczema patients are asked about their alcohol behaviour to fully understand patterns of disease exacerbation and to accurately assess risk when choosing systemic medications.

Introduction

Alcohol has been central to the social behavior of many cultures for centuries but there is increasing recognition of the significant contribution to global disease burden. Alcohol is estimated to be responsible for 2.3 million premature deaths worldwide per year. In the UK there is rising concern about the current levels of ill health caused by alcohol and that this needs to be tackled [2]. For example, the annual cost of alcohol related harm in the UK is estimated to be between £17.7 and £25.1 billion [3] with healthcare costs alone reaching £3.5 billion annually [4]. The topography of drinking behaviour in England reveals that the highest proportion of high risk (heavy) drinkers are in the North East (32%) alongside Yorkshire and the Humber (32%). These are followed by London (31%), North West (30%), East Midlands, South East, South West (28%), West Midlands (23%) and East of England (21%)[5].

Chronic inflammatory skin conditions such as eczema and psoriasis are prevalent in western countries imposing considerable financial and psychological burdens [6]. Previous studies have shown that patients with psoriasis have higher levels of alcohol consumption in comparison to healthy controls [7]. Moreover, heavy drinking has also been shown to exacerbate psoriasis[8, 9] and abstaining from drinking to improve it[10]. Patients with chronic skin conditions suffer considerable stress, social anxiety, avoidance, embarrassment and low self-esteem related to

their condition[11, 12]. Studies have shown the prevalence of anxiety to be as high as 43% in patients with chronic psoriasis[13] and in one study 25% met the criteria for generalized anxiety disorder[14].

Whether heavy drinking in psoriasis patients is a trigger or a consequence of psychological distress remains uncertain. [9, 15 16]. However, biochemical links between alcohol and both acute and chronic inflammation have been reported showing that alcohol can induce pro-inflammatory cytokines, lymphocyte activation and, keratinocyte proliferation[8, 17]. The relationship between heavy drinking and other types of chronic inflammatory skin conditions such as eczema and cutaneous lupus is not yet established.

Alcohol use disorders (AUD) is a collective term that refers to hazardous, harmful or dependent alcohol drinking[18]. All three consumption patterns are forms of heavy drinking. Hazardous drinking is the consumption of alcohol at a level or pattern that increases the risk of physical or psychological problems. Harmful drinking is defined by the presence of these problems.

Awareness of the problematic alcohol behaviour in some of our psoriasis patients prompted an interest in developing clinic-based interventions to reduce alcohol intake. However, given the increasing data supporting the pro-inflammatory effects of alcohol in various diseases, we hypothesised that the prevalence of alcohol use disorders may be high in other inflammatory skin diseases as well as psoriasis which may also benefit from alcohol reduction interventions. This study was designed to examine the prevalence of heavy drinking using the Alcohol Use Disorders Identification Test (AUDIT) in patients with inflammatory skin disease. We also assessed psychological distress using the Dermatology Life Quality Index [19] and the Hospital Anxiety and Depression Scale[20].

Methods

Study design and settings

This single site observational cross sectional study took place in a Dermatology tertiary centre seeing up to 400 dermatology patients a day between 2nd October 2012 and 5th September 2014. Between 4 and 16 general and specialised dermatology clinics ran daily. Initially, patients in the waiting area were approached by a clinical research nurse. Nearer the end of the study

certain clinics were targeted to try and fulfil the recruitment target for the lupus group. Research nurses consented the patients and collected clinical information and demographics (age, sex), body sites involved, types of treatment used. Patients completed three research tools: Alcohol Use Disorder Identification Test (AUDIT)[21] , Hospital Anxiety and Depression Scale (HADS)[20] and Dermatology Life Quality Index (DLQI)[19].

Two groups of patients were targeted; Group 1 with inflammatory skin diseases, further subdivided into psoriasis, eczema, cutaneous lupus and other inflammatory skin diseases (the variety of 'other' is shown in supplementary table 2); and Group 2 patients with non-inflammatory skin diseases (mainly skin lesions) representing the reference population. The aim was to recruit 120 patients into each of the four sub-groups of Group 1 and 240 patients into Group 2. Inclusion criteria were written informed consent, age ≥ 18 years and confirmed diagnosis of an inflammatory skin disease (for Group 1) or of non-inflammatory and non-itchy skin disease (for Group 2) made by a Dermatologist. The only exclusion criterion for both groups was the inability to give informed consent.

Screening tools

All the data were collected whilst patients were in clinic. Research nurses were available to help with understanding of the questionnaires if needed. The AUDIT [22] is a validated, WHO approved, simple screening test to identify hazardous, harmful and potentially dependent alcohol drinking [23]. It consists of ten questions that cover the frequency, quantity and intensity of current drinking levels. It also covers current and past problems associated with alcohol drinking. Each question scores between 0 and four giving a maximum score of 40. Depending on the score, participants are categorised into five categories; abstainers (total score of 0); low risk drinking (total score 1-7); hazardous drinking (total score 8-15); harmful drinking (total score 16-19); probable dependence (total score of 20 or above). Hazardous drinking is drinking at a level that is likely to cause physical or psychological problems. Harmful drinking is a level where symptoms of harm have occurred. A score of 8 or more indicates an alcohol use disorder (AUD)[22]. Having an AUD would be regarded as heavy drinking Participants were provided with a visual aid of common alcohol-based drinks and their corresponding units and asked to complete the questionnaire with respect to their drinking over the last year.

The HADS[24] is a tool designed to measure anxiety and depression symptomatology in non-psychiatric clinics. It consists of 14 questions, of which seven relate to the Anxiety subscale

(HADS-A) and seven to the Depression subscale (HADS-D). The patient is asked to consider the questions with respect to the last week. Scores between 8-10 suggest 'possible' and scores above ten 'probable' clinically significant symptoms of anxiety or depression [24]. Other researchers have suggested interpretation levels of 8-10 mild, 11-15, moderate and over 16 severe anxiety and depression[25].

The DLQI is a validated scoring system designed to assess the impact of skin disease on a patient's quality of life [19]. It consists of ten questions and the scores range between 0 and 30 based on the patient's experiences in the last week. A score of 11 or more is considered to indicate severe impact[26]. A questionnaire collecting date of birth, gender, clinical details such as disease duration, sites affected and treatment history and demographic data was used to record background information.

Statistical methods

The analysis focussed on descriptive statistics. Estimates of recruitment rates were calculated, together with numbers recruited into each of the study groups. Means, medians, standard deviations (SDs) and inter-quartile ranges (IQRs) were calculated for AUDIT, HADS and DLQI scores. Numbers and percentages were derived for the following dichotomous variables: male gender; prevalence of probable anxiety; prevalence of probable depression; severe impact on life quality; and prevalence of AUD.

The pre-specified analysis compared the prevalence of AUD among psoriasis patients relative to patients with non-inflammatory disease. Based on the target numbers for recruitment, there was 99% power to detect a doubling in the prevalence of AUD in the psoriasis group, based on a two-sided test at the 5% level. Whilst not pre-specified, the level of power applies to the comparison of any of the other three inflammatory disease groups with the reference group. Exploratory analyses compared the prevalence of AUD in patients with other types of inflammatory disease with that in the non-inflammatory disease group and investigated adjustment for potential confounders, using logistic regression to calculate odds ratios and 95% confidence intervals (CIs). The initial analysis adjusted for age and sex only. Adjustment for age was made using period of birth based on the following categories: before 1945; 1945-59; 1960-74; and 1975 onwards. A further analysis was performed to also adjust for DLQI to allow a more detailed inspection of the eczema results.

The analysis was conducted using SPSS version 21 (IBM, 2012). No adjustments were made for missing values. In particular, AUDIT scores were calculated only for those patients who answered all ten questions on the AUDIT questionnaire. Rates of missing data were reported, together with 95% CIs.

Results

A total of 618 patients were approached and of these, seven patients (1.1%) were ineligible: three patients were under the age of 18, one patient did not wish to complete the questionnaire and three were ineligible for unspecified reasons. Two further patients withdrew their consent and their data were not included. Figure 1 shows the recruitment pathway. The analysis was therefore based on 609 patients, 98.5% of those approached. The mean birth years of those recruited were psoriasis 1966.7, eczema 1969.81, lupus 1959.03, other inflammatory 1965.11 and the non-inflammatory reference group 1948.1. Supplementary table 1 describes the number of patients recruited to each group. The lupus group (61 recruited) and the non-inflammatory group (181 recruited) were below the recruitment targets of 120 and 240 respectively.

In the inflammatory group there was a female preponderance (59.6% versus 40.4%), whereas the non-inflammatory group had more males (51.9%) than females (40.1%). The median year of birth was 1965 (inter-quartile range (IQR) 1954-1980) for Group 1 and 1945 (IQR 1937-1957) for Group 2. There was a wide variation of disease duration between the study groups as expected (Tables 3 and 4).

Alcohol use

Out of the 609 participants, 18 patients, i.e. 3% (95% CI 1.6-4.3%), had missing information for at least one of the ten AUDIT questions. Overall, male patients had higher AUDIT scores (median 5, IQR 2-9) than females (median 3, IQR 1-5). Younger people had higher scores with scores increasing in later years of birth; median score (IQR) of 2 (0-4) for those born before 1945, 3 (1-6) for those born in 1945-59, 4 (2-8) for those born in 1960-74 and 5 (3-9) for those born in 1975 or later.

Overall 22.7% (95% CI 19.1-26.8%) of all patients had an AUD (Table 1). There was a higher prevalence of AUDs in all the inflammatory groups combined in comparison to the non-

inflammatory group: 24.5% vs 14.3%. Eczema patients had the highest prevalence of AUD (33.3%) amongst the inflammatory groups (Table 1).

Exploratory analyses calculated the OR for having an AUD in the inflammatory groups relative to the reference groups (Table 2). The 95% CI for the unadjusted OR lay entirely above 1 for psoriasis and eczema patients; in contrast, the OR was significantly raised only for eczema patients after adjustment for gender and period of birth and was not significantly raised for any of the groups after additionally adjusting for DLQI. Adjustment for anxiety or depression did not change the psoriasis and eczema results materially (results not shown).

For the individual study groups, the mean and median AUDIT scores are shown in Tables 3 and 4 respectively. AUDIT scores were similar in psoriasis (median 5, IQR 2-9) and eczema (median 5, IQR 1-8) groups and higher in these two groups than the others.

AUDs were more prevalent in males (33.7%) than in females (13.9%). It was also more prevalent in younger patients (34.0% amongst those born from 1975 onwards) in comparison with older patients (10.4% amongst those born before 1945). Examining individual groups, AUDs were generally more predominant if patients were male and of a younger age. Those with higher anxiety and depression scores had a higher percentage of AUDs: 33.3% of those with HADS-Anxiety score of 11 or above compared with 21% of those with a lower anxiety score, and 35.3% of those with HADS-Depression score of 11 or above compared with 19.9% of those with a lower depression score.

Quality of life

Out of the 609 participants, 2.5 % had missing information for at least one of the ten DLQI questions. 21% of the study population scored 11 or more, representing severe impact. This percentage was 22.6% for females, 19.1% for males, and was higher among those born from 1975 onwards (32.7%) relative to born before 1945 (4.5%). Tables 3 and 4 show the mean and median DLQI scores respectively with higher scores consistently seen in the inflammatory disease groups compared with the reference group. Among disease groups, the percentage of patients with a total DLQI score of 11 or more was greatest for eczema patients, namely 43.7% (Table 5)

Anxiety and depression symptomatology

Out of the 609 participants, 6.6 % had missing information for at least one of the 14 HADS questions. The mean total HADS score for all patients was 10.62 (SD 8.29) (Table 3). The mean score for females was 11.30 (SD 8.38) whereas that for males was 9.75 (SD 8.10). There was no variation of the mean total HADS scores amongst different age groups: those born from 1975 onwards had a mean score of 10.69 (SD 8.6) and those before 1945 9.77 (SD 7.05). Amongst the inflammatory groups, eczema patients had the highest mean score 13.13 (SD 9.45) (Table 3).

Supplementary table 2 shows the range of diagnoses in the other inflammatory and non-inflammatory groups and supplementary table 3 shows the body site involvement and treatments received by the different groups.

Discussion

The study assessed the prevalence of AUDs in patients with psoriasis and other inflammatory skin conditions and compared it to a reference population using validated tools. One of the most interesting and novel results was the high level of AUDs in (33.3%) patients with eczema. Historically a high alcohol intake has been associated with psoriasis and, in the clinic, we have not particularly focused on alcohol consumption in eczema patients. As expected this study also confirmed the high prevalence of AUDs in patients with psoriasis. However, psoriasis patients were more likely to be male and to be older than patients in the reference group, and there was less evidence for an association with AUDs after adjusting for gender and period of birth. The OR for having an AUD with eczema relative to the non-inflammatory group was significant when adjusting for age and sex although this relationship was weakened by adjustment for DLQI. The relationship between DLQI and alcohol consumption is clearly complex. The degree to which the DLQI may be a relevant confounding variable in the relationship between AUD and eczema will depend on the relative independent influence of alcohol on both the eczema and on the DLQI.

There is very little data on AUDs in patients with skin diseases other than psoriasis. There is one mention in a paper reporting links between eczema and cardiovascular disease in which a secondary analysis showed that eczema was associated with increased odds of ever drinking

12 or more alcoholic beverages annually (OR 1.16 CI 1.03-1.31)[27]. No data was available on whether the individuals had an AUD.

This finding has significant implications as Dermatologists have generally not previously focussed on alcohol behaviour in patients with eczema. The prescribing of systemic medication, including drugs such as azathioprine[28] and methotrexate[29], for the treatment of severe eczema is increasing and excess alcohol consumption must be considered when making treatment choices. Also, the possibility that alcohol could play a role in exacerbations of eczema needs to be explored during consultations and with further research.

We found that patients with inflammatory skin conditions had higher DLQI scores than the reference group. The mean (Table 3) and median (Table 4) DLQI scores were higher in all the inflammatory disease groups than in the reference non-inflammatory group. These findings are consistent with previous studies which have documented the negative effect of chronic inflammatory skin disease on life quality[11].

Although there are not specific cut-offs for defining anxiety and depression symptomatology using HADS the authors of the test have given guidelines of 8-10 mild, 11-15 moderate and 16 and over being indicative of severe anxiety and depression. The HADS score is not disease specific and many experiences may influence a patient's score. The mean scores for psoriasis (11.38) and eczema (13.13) were greater than that for the non-inflammatory group (8.56). HADS scores from the general adult population have been reported with a mean score of 9.82 (SD 5.98)[25]. Our data suggest that having an inflammatory skin disease needing hospital referral is associated with at least moderate anxiety and depression symptoms.

The prevealence of AUDs in our reference group was similar to rates found in other studies. Brown et al have performed a population survey in England in 2016 where they showed that the 12 month prevalence for an alcohol use disorder was 15.5%[30] which is very similar to the rate recorded in our non-inflammatory group of 14.3%. Also, data from the US, from Grant et al[31] , using slightly different methodology, showed that the 12 month prevalence of an alcohol use disorder in non-institutionalised men was 13.9%. We are satisfied that the use of a control group from the same clinic as the patients with inflammatory skin disease was the best way to reduce bias and it is interesting but not surprising that the rates of AUDs in our reference population of non-inflammatory skin disease are similar to those in other general populations.

The proportion of AUDs in the psoriasis patients was similar to previous reports of alcohol consumption using other scoring methods which have shown between 17% and 30% of psoriasis patients having problems with alcohol[9]. The AUDIT is now regarded as the gold standard for assessing AUDs and has also been confirmed as the best score to use specifically in patients with psoriasis[9]. In the past various studies using different methodologies have also reported an excess of alcohol problems in patients with psoriasis relative to patients with other skin diseases. Poikolainen et al [16] reported an OR for psoriasis with an alcohol intake of 100g/day compared with no intake as 2.2 (CI 1.3-3.9) (The UK standard for one unit of alcohol contains 8g alcohol). ,

The acceptability of completing questionnaires was high with only small numbers of patients declining to take part. Patients were aware that all the study information was non-identifiable. It is possible that in a real life clinic with all information entering the medical record, that some patients would be less willing to complete questionnaires. To get a more accurate measure of acceptability we would need to investigate use of the questionnaire, particularly the recording of AUDIT scores in clinical records, in a wider variety of real clinical settings. There were no issues with staff acceptability in conducting the AUDIT questionnaire.

Although attempts were made to reduce recruitment bias within the study, some bias cannot be excluded; for example, the involvement of research nurses in multiple other psoriasis biologic drug studies may have led to a lower recruitment to this study of psoriasis patients receiving biologic drugs. We did not attempt to assess clinical disease severity in part due to the difficulties in comparing between different diseases. Also, the single teaching hospital outpatient site design also means that the patients were likely to have more severe skin disease than average and it is, therefore, not possible to extrapolate the results to all patients with eczema and psoriasis. Moreover, North East England is a typically heavy drinking region of the country and so rates may differ in Southern regions.

Does alcohol have a causal role in inflammatory skin disease?. Many patients will report exacerbations of skin disease in relation to periods of alcohol excess. The links between psychological distress, severe skin disease and excess alcohol have been observed in psoriasis[15] and it seems likely that the relationship of alcohol to skin diseases will be both a trigger and an outcome. Our new data on alcohol and eczema greatly expands the number of patients whose

skin disease severity may be influenced by alcohol. In future investigations it may be more useful to examine individuals in detail rather than looking for trends in large populations.

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Conclusion

This observational cross sectional study has suggested a new association between AUDs and eczema, whereas there was less evidence of an association between AUDs and psoriasis. Larger studies are needed to investigate these findings in community settings and in patients with less severe skin diseases. Very few patients were unwilling to complete the alcohol use disorders identification test. Greater efforts are needed to identify patients with a heavy alcohol consumption in the Dermatology clinics to ensure safe drug prescribing and to allow support and advice in achieving safe levels of alcohol consumption. Studies to disentangle causality in alcohol and inflammatory skin disease will be challenging. Brief alcohol interventions that can lead to a reduction in alcohol consumption have been shown to work in other clinical settings [32] and further work is needed to explore their effectiveness in Dermatology.

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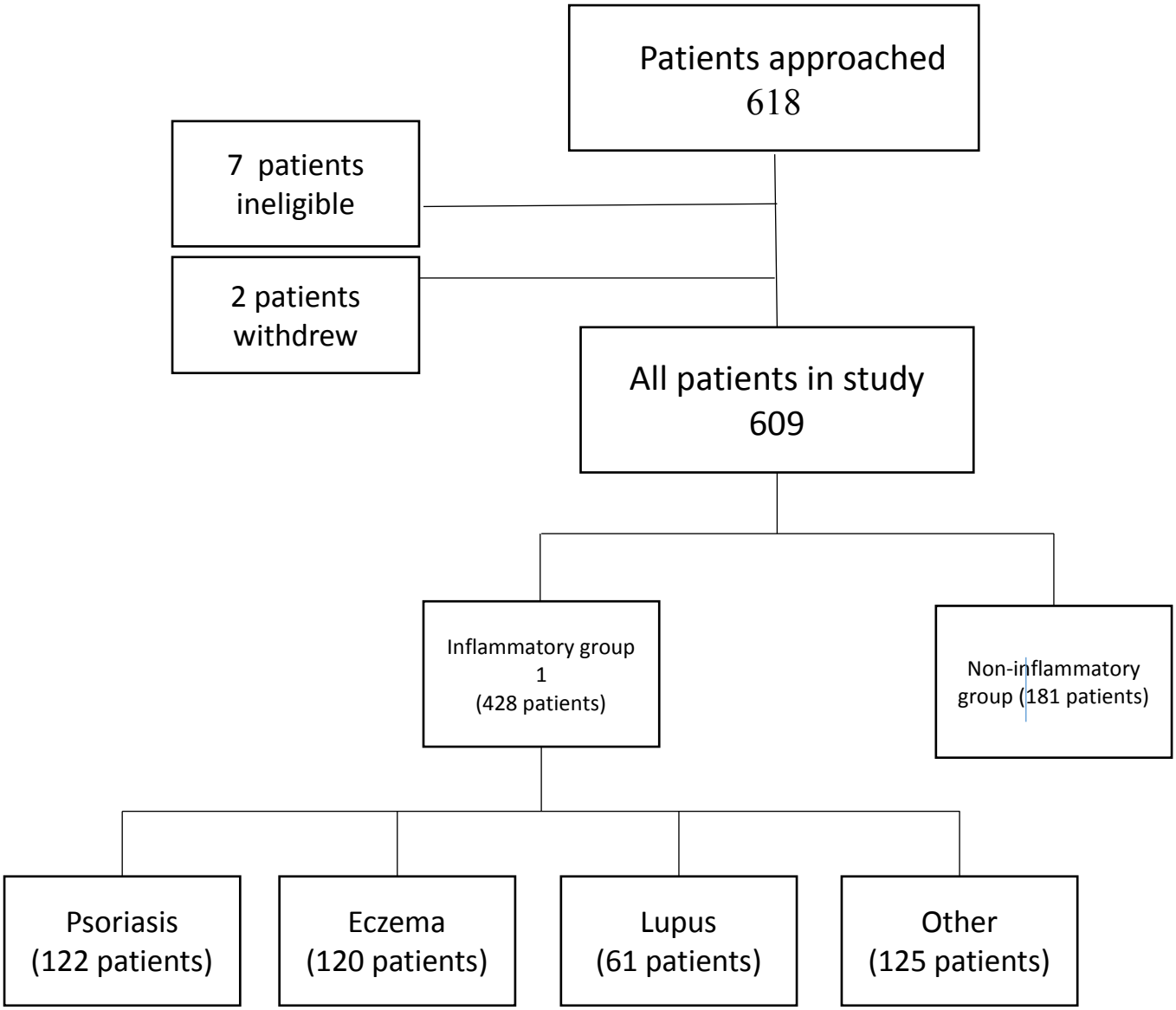

Figure 1: Study population

		Alcohol use disorder (8+ on AUDIT)		
Study Group		No	Yes	Total
Group 1A (Psoriasis)	Count	84	37	121
	% within Group	69.4%	30.6%	100%
Group 1B (Eczema)	Count	76	38	114
	% within Group	66.7%	33.3%	100%
Group 1C (Lupus)	Count	50	7	57
	% within Group	87.7%	12.3%	100%
Group 1D (Other inflammatory)	Count	97	27	124
	% within Group	78.2%	21.8%	100%
Group 1 (All inflammatory)	Count	307	109	416
	% within group	76.5%	24.5%	100%
Group 2 (Non-inflammatory)	Count	150	25	175
	% within Group	85.7%	14.3%	100%
Total	Count	457	134	591
	% within Group	77.3%	22.7%	100%

Table 1: Number of patients with an AUD (8+ on AUDIT) in the different study groups

Note: Restricted to patients with complete information from AUDIT.

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Table 2: Number of patients with an AUD (8+ on AUDIT) in the different study groups

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	% within Group	85.7%	14.3%	100%
Total	Count	457	134	591
	% within Group	77.3%	22.7%	100%

Table 3: Number of patients with an AUD (8+ on AUDIT) in the different study groups

Note: Restricted to patients with complete information from AUDIT.

		Alcohol use disorder (8+ on AUDIT)		
Study Group		No	Yes	Total
Group 1A (Psoriasis)	Count	84	37	121
	% within Group	69.4%	30.6%	100%
Group 1B (Eczema)	Count	76	38	114
	% within Group	66.7%	33.3%	100%
Group 1C (Lupus)	Count	50	7	57
	% within Group	87.7%	12.3%	100%
Group 1D (Other inflammatory)	Count	97	27	124
	% within Group	78.2%	21.8%	100%
Group 1 (All inflammatory)	Count	307	109	416
	% within group	76.5%	24.5%	100%
Group 2 (Non-inflammatory)	Count	150	25	175
	% within Group	85.7%	14.3%	100%
Total	Count	457	134	591
	% within Group	77.3%	22.7%	100%

Table 4: Number of patients with an AUD (8+ on AUDIT) in the different study groups

Note: Restricted to patients with complete information from AUDIT.

		Alcohol use disorder (8+ on AUDIT)		
Study Group		No	Yes	Total
Group 1A (Psoriasis)	Count	84	37	121
	% within Group	69.4%	30.6%	100%
Group 1B (Eczema)	Count	76	38	114
	% within Group	66.7%	33.3%	100%
Group 1C (Lupus)	Count	50	7	57
	% within Group	87.7%	12.3%	100%
Group 1D (Other inflammatory)	Count	97	27	124
	% within Group	78.2%	21.8%	100%
Group 1 (All inflammatory)	Count	307	109	416
	% within group	76.5%	24.5%	100%
Group 2 (Non-inflammatory)	Count	150	25	175
	% within Group	85.7%	14.3%	100%
Total	Count	457	134	591
	% within Group	77.3%	22.7%	100%

Table 5: Number of patients with an AUD (8+ on AUDIT) in the different study groups

Note: Restricted to patients with complete information from AUDIT.