AUDIT

Cardiovascular disease risk assessment in psoriasis patients

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Abstract

Background Psoriasis is a significant health problem that affects 2.2% of the UK population. Recent evidence also suggests an association between psoriasis and an increased risk of cardiovascular disease (CVD). As such, the National Institute for Health and Care Excellence (NICE) guidelines have made recommendations pertaining to cardiovascular risk management in psoriasis patients.

Aims An audit was conducted on a single general practice to evaluate how well the practice was managing the CVD risk of its psoriasis patients on repeat prescription.

Methods A search was conducted on the practice's computer database to identify all patients who are coded as suffering from psoriasis. Prescription records were then reviewed to ascertain whether the patient was currently on repeat prescription for psoriasis treatment. Patient records were then used to determine the severity of these patients' psoriasis, and whether their CVD risks were calculated and managed appropriately.

Results A total of 32 patients on repeat prescription for psoriasis were identified. The practice performed moderately well, with 87.5% of its adult severe psoriasis patients, 73.9% of its psoriasis patients aged 40–74 years and 100% of its psoriasis patients with a 10-year CVD risk ≥ 20% being adequately managed as per NICE guidelines.

Conclusion This audit highlighted to the practice's clinicians that psoriasis patients require more CVD risk monitoring to achieve ideal 100% standards. Appointments were arranged for patients whose CVD risk had not been adequately assessed. Plan to re-audit in 12 months, and at least every five years thereafter.

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Introduction

Psoriasis is a significant clinical condition as it affects approximately 2.2% of the UK population,[1] and is associated with considerable reduction in health-related quality of life.[2] In addition, recent studies have indicated that psoriasis patients are at increased risk of cardiovascular disease (CVD).[3–5] This has been attributed to the similarities in T helper (Th)-cell-driven inflammation, as well as the increases in pro-inflammatory cytokines, which underlie both psoriasis and atherosclerosis.[6] These associations, if proven true, possess great implications for the management of psoriasis. Firstly, the recognition and treatment of modifiable CVD risk factors in patients with psoriasis may help reduce associated cardiovascular morbidity and mortality. Equally, the effective management of co-morbidities may also alleviate psoriasis, and thus maximise therapeutic outcomes.

According to the 2012 National Institute for Health and Care Excellence (NICE) clinical guidance for psoriasis,[7] adults with severe psoriasis (defined as requiring treatment with phototherapy, systemic agents or hospital admission) of any type should be offered cardiovascular risk assessment at presentation using a validated risk-estimation tool. Further assessment of cardiovascular risk should be offered every five years, or more frequently if required. In addition, risk factors for cardiovascular co-morbidities should be discussed with people who have any type of psoriasis.[7]

However, a recent survey conducted by Parsi et al.[8] found that 45% of primary care physicians and cardiologists were unaware of the link between psoriasis and CVD, and that psoriasis patients were not routinely screened for their cardiovascular risk factors. While this survey was conducted on American physicians, it is probable that in the UK psoriasis patients are not being adequately screened for cardiovascular risk as per guidelines. This situation may be compounded by the fact that the management of psoriasis is not included in the Quality Outcomes Framework (QOF),[9] which rewards general practices in the UK according to how well they care for patients with certain diseases, and may thus result in the neglect of cardiovascular risk assessment in psoriasis patients.

Hence, an audit was conducted in a single general practice to evaluate whether adults with severe psoriasis are being adequately assessed for their cardiovascular risk using a validated risk-estimation tool. In view of the fact that the recommendation only specified patients with severe psoriasis, the audit will also review whether cardiovascular risk assessments are being carried out in the mild/moderate psoriasis patient population as per guidelines for the primary and secondary prevention of CVD.[10]

The standards the practice should meet are as stated by the *National Audit Support Guide*, which are typically 100% adherence to the guidelines, with or without certain exceptions.[11,12]

Table 1: NICE criteria and standards for CVD risk assessment in psoriasis patients.

Criterion	Standard
Percentage of adults with severe psoriasis of any type who are offered a cardiovascular risk assessment at presentation using a validated risk-assessment tool. Further assessments of cardiovascular risk are offered at least every five years[11]	100% No exceptions
There is a systematic strategy in place to identify people aged 40–74 years who are likely to be at high risk of CVD[12]	100% No exceptions
Percentage of people with a 20% or greater 10-year risk of developing CVD who have statin therapy as part of the primary prevention management strategy[12]	100% Exceptions: – People who have potential drug interactions or contraindications – People who decide, after an informed discussion with their clinician about risks and benefits, not to start statin therapy

The criteria and standards for the audit are summarised in Table 1.

Thus, the aim of this audit is to give an objective evaluation of how the practice is doing in terms of managing the cardiovascular risk of its psoriasis patients. The audit also expects to identify some patients whose cardiovascular risk has not been adequately assessed. These patients would then be highlighted to the practice, so that their CVD risk can be appropriately managed.

Consequently, recognition that psoriasis could be an independent cardiovascular risk factor may help to decrease cardiovascular co-morbidities amongst the psoriasis population, and thus improve patients' overall quality of life. There will also be significant economic benefit to the NHS, as it has been found that psoriasis patients with co-morbidities such as hyperlipidaemia utilised healthcare services more frequently and incurred greater healthcare costs than patients with psoriasis alone.[13]

Methods

A search was first conducted on the practice's computer system to identify all the registered patients who are coded as suffering from psoriasis. This came back with 189 patients. Prescription records were then manually reviewed to ascertain whether the patient was currently on repeat prescription for psoriasis treatment. It was found that there were 32 patients who are coded on the system as having psoriasis and are currently being prescribed psoriasis medications on a repeat basis.

Medical records and clinic letters of the 32 patients were then analysed to extract the following details:

- age
- diagnosis
- severity of psoriasis*
- psoriasis medications on repeat prescription
- alcohol intake and status†
- smoking intake and status‡
- total cholesterol level
- high-density lipoprotein (HDL) level
- body mass index (BMI)
- blood pressure
- diabetes status
- 10-year CVD risk (based on the Joint British Societies Cardiovascular Risk Prediction Chart[14])
- date 10-year CVD risk was assessed
- whether currently on statin therapy.

* Severe psoriasis being defined by NICE(7) as requiring treatment with phototherapy, systemic agents or hospital admission.
† Trivial: <1 unit/day; light: 1–2 units/day; moderate: 3–6 units/day; heavy: 7–9 units/day.
‡ Never smoked; light: 1–9 cigarettes/day; moderate: 10–19 cigarettes/day; heavy: 20–39 cigarettes/day.

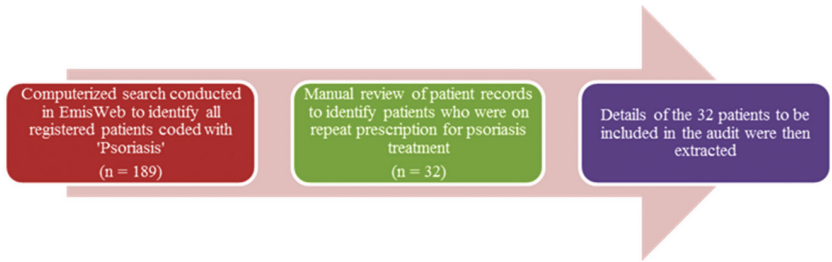

Figure 1: Flow chart of how patients to be included in the audit were identified.

Lastly, the average 10-year CVD risk for psoriasis patients currently on repeat prescription and that for non-psoriasis patients were calculated using the practice computer system, for the comparison of cardiovascular risk between these patient groups.

Results

According to the NICE guidelines, 'severe psoriasis' is defined as that which requires treatment with phototherapy, systemic agents or hospital admission.[7] Thus, of the 32 psoriasis patients on repeat psoriasis prescription, 8 patients met the criteria of having severe psoriasis. Of these 8 patients, it was found that 7 had been assessed using a validated risk-

estimation tool (Joint British Societies Cardiovascular Risk Prediction Chart) within the last five years, whereas 1 patient had not been assessed (patient 4,095).

Of the sample group of 32 patients, 23 were aged 40–74 years, and should thus be systematically screened to determine whether they are at high risk of CVD. However, of these 23 patients, there were 6 patients whose cardiovascular risk had not been assessed (patients 548, 879, 4,095, 6,319, 9,825, 12,372).

Also, of the 23 patients aged 40–74 years, there are 2 patients with a 10-year CVD risk greater than or equal to 20% (patients 1,308, 9,671). However, neither of these patients is currently on statin therapy for primary prevention of CVD. Upon review of their computerised records, it was shown that both patients 1,308 and 9,671 had declined statin therapy after an informed discussion with the doctors at the practice, on 21 January 2014 and 25 October 2012 respectively.

The practice's performance in relation to the criteria are thus summarised in Table 2.

Table 2: Summary of practice's audit performance.

Criterion	Standard	Practice performance
Percentage of adults with severe psoriasis of any type who are offered a cardiovascular risk assessment at presentation using a validated risk-assessment tool. Further assessments of cardiovascular risk are offered at least every five years[11]	100%	87.5% (7 out of 8 patients)
There is a systematic strategy in place to identify people aged 40–74 years who are likely to be at high risk of CVD[12]	100%	73.9% (17 out of 23 patients)
Percentage of people with a 20% or greater 10-year risk of developing CVD who have statin therapy as part of the primary prevention management strategy[12]	100% Exceptions: – People who have potential drug interactions or contraindications – People who decide, after an informed discussion with their clinician about risks and benefits, not to start statin therapy	100% exception (2 out of 2 patients)

Further details of the audit data can be found in the Appendix.

The average 10-year CVD risk of the non-psoriasis patients currently registered with the practice, mild/moderate psoriasis patients on repeat prescription and severe psoriasis patients on repeat prescription was found to be 10.48%, 13.04% and 10.08% respectively.

Discussion

The aim of this audit was to evaluate how well the practice is managing the cardiovascular risk of its psoriasis patients, in accordance with NICE guidelines. In view of the evidence supporting the notion of a directly proportional relationship between the severity of psoriasis and the increase in cardiovascular risk,[15,16] the average cardiovascular risk of non-psoriasis patients, mild/moderate psoriasis patients and severe psoriasis patients was also investigated.

Results from the audit showed that the practice only managed to adequately assess the cardiovascular risk in 87.5% of its adult patients with severe psoriasis, whereas only 73.9% of its psoriasis patients aged 40–74 years were identified and assessed for high risk of CVD. However, it should be noted that the practice has met the 100% standard in managing its psoriasis patients with a 20% or greater 10-year CVD risk with statin therapy, with the therapy being offered and declined by the patients' informed decision.

Another interesting finding from this audit was that while current literature proposes a dose–effect relationship, whereby cardiovascular risk increases with the severity of psoriasis, this was not observed in the practice's population of psoriasis patients on repeat prescription. It was found that non-psoriasis patients had a cardiovascular risk of 10.48%, mild/moderate psoriasis patients on repeat prescription had an increased cardiovascular risk of 13.04%, but severe psoriasis patients on repeat prescription had a decreased cardiovascular risk of 10.08%. The inconsistency between the results obtained from this audit and the existing literature could be attributed to three main reasons.

Firstly, based on the methodology, only eight severe psoriasis patients on repeat prescription were identified for this audit. Hence, the average cardiovascular risk calculated from this small sample group is inconclusive. Furthermore, owing to time constraints, the medical records of psoriasis patients not on repeat prescription were not reviewed. This meant there could potentially be psoriasis patients who receive systemic treatment directly from secondary care, but are not on the practice's repeat prescription register, who were not identified. Exclusion of this patient group could have negatively affected the findings.

Secondly, while the psoriasis area and severity index (PASI) is considered the gold standard for assessing the severity of psoriasis,[17] this audit assessed severity based on the treatment that the patient is on. In PASI, severity of psoriasis is dependent on the redness, induration, scaling and area of body surface involved. PASI scores range from 0 (no disease) to 72 (maximal disease), with severe psoriasis being defined as a PASI score greater than 20.[18] On the other hand, this audit followed the NICE definition of severe psoriasis as requiring treatment with phototherapy, systemic

agents or hospital admission.[7] Thus, based on this definition, the eight patients who are classified as having severe psoriasis are those who are on systemic therapy. Most importantly, seven out of these eight patients are on methotrexate. Methotrexate, which has anti-inflammatory properties, has recently been shown to reduce the risk of CVD in patients with chronic inflammation.[19] As such, the prevalent use of methotrexate in the small sample group of severe psoriasis patients may have contributed to the decreased cardiovascular risk of 10.08%.

Thirdly, it should be noted that while traditional cardiovascular risk factors[20] such as age, gender and diabetes were recorded for the sample group, these were not adjusted for when calculating the average cardiovascular risk for the patients. As such, traditional cardiovascular risk factors may have been more prevalent in the mild/moderate psoriasis patient group, which could explain the higher cardiovascular risk observed as compared with the severe psoriasis patient group.

As such, taking into account the aforementioned reasons, the average 10-year CVD risk calculated for the non-psoriasis patients, mild/moderate psoriasis patients and severe psoriasis patients should be used for reference only, and does not invalidate the dose–effect relationship observed by other major studies.

Conclusion

There has been increasing evidence to support an association between psoriasis and cardiovascular morbidity. Additionally, there appears to be a directly proportional relationship between the severity of psoriasis and the increase in CVD risk. While results are not yet conclusive, and more rigorous research is required to ascertain the link between psoriasis and CVD, it remains prudent to actively assess the CVD risk in psoriasis patients.

Results of the audit have shown that the practice has performed moderately well in managing the CVD risk of its psoriasis patients. While this finding is encouraging, the practice could aim to achieve the ideal 100% standard. This could be accomplished by raising awareness amongst the practice's GPs about the association between psoriasis and increased CVD risk, as well as ensuring that GPs are actively assessing the CVD risk in psoriasis patients through regular re-auditing of the topic.

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Appendix

Psoriasis patients and CVD risk

Patient code	Age (years)	Diagnosis	Psoriasis medication on repeat	JBS 10-year CVD risk	Date CVD risk was recorded	Statin therapy
429*	61	Psoriatic arthropathy	Methotrexate 2.5 mg, sulfasalazine 500 mg	3.23	27 August 2013	None
441†	29	Psoriasis NOS, psoriasis and similar disorders	Exorex lotion, Doublebase gel	Not recorded	Not recorded	None
548†	42	Psoriasis NOS	Dermol 200 shower emollient	Not recorded	Not recorded	None
614*	64	Psoriatic arthropathy, psoriasis and similar disorders	Methotrexate 2.5 mg, Diprobase cream, Dermol 500 lotion	10.51	8 November 2013	None
879†	59	Psoriasis NOS	Dovobet gel	Not recorded	Not recorded	None
897	64	Psoriasis NOS	Lotiderm cream, Dovobet gel	10.5	23 April 2013	None
1,308	70	Psoriasis NOS	Lotriderm cream, calcipotriol 0.005%/ betamethasone dipropionate 0.05%, Dermol cream, Doublebase gel	33.69	8 October 2013	None
2,370*	47	Psoriatic arthropathy	Methotrexate 2.5 mg, prednisolone 5 mg	16.7	5 November 2013	Atorvastatin
2,782*	39	Psoriasis NOS	Methotrexate 2.5 mg	6.57	6 February 2012	None
4,034	54	Psoriatic arthropathy, psoriasis NOS	Calcipotriol 0.005%/ betamethasone dipropionate 0.05% ointment, paracetamol 500 mg	2.95	16 October 2013	None

Patient code	Age (years)	Diagnosis	Psoriasis medication on repeat	JBS 10-year CVD risk	Date CVD risk was recorded	Statin therapy
4,095*†	50	Psoriasis NOS	Hydromol Bath&Shower emollient, tacrolimus 0.1% ointment, Hydromol ointment, Doublebase gel, Dermax Therapeutic 0.5% shampoo, coconut oil compound ointment, Dovobet gel, Diprosalic 0.05%/3% ointment	Not recorded	Not recorded	None
4,675	65	Psoriasis NOS	Diprobase cream	10.75	6 June 2013	Simvastatin
6,319†	54	Psoriasis NOS	Dermax Therapeutic 0.5% shampoo, hydrocortisone 1% cream	Not recorded	Not recorded	None
6,899	55	Psoriasis NOS	Dermax Therapeutic 0.5% shampoo, Aveeno body wash, Aveeno lotion, Aveeno cream	7.48	22 October 2013	None
6,946*	63	Psoriatic arthropathy	Methotrexate 2.5 mg, fFolic acid 5 mg	13.99	7 January 2014	Atorvastatin
6,961	57	Psoriasis NOS	QV gentle wash, calcipotriol 0.005%/ betamethasone dipropionate, Emollin aerosol spray, hydroxyzine 25 mg tablets	8.15	30 December 2013	Simvastatin
8,002‡	80	H/O psoriasis	Cetraben emollient cream	43.59	9 January 2014	Pravastatin
8,840	74	Psoriasis unspecified	Sebco ointment	15.56	16 September 2013	Simvastatin

Patient code	Age (years)	Diagnosis	Psoriasis medication on repeat	JBS 10-year CVD risk	Date CVD risk was recorded	Statin therapy
9,089	52	Psoriasis NOS, H/O psoriasis	Calcipotriol 0.005%/ bethamethasone dipropionate 0.05% ointment	9.13	22 May 2012	None
9,671‡	70	Psoriasis NOS	Betacap 0.1% scalp application	27.37	5 September 2012	None
9,717†	24	Psoriasis NOS	Epaderm cream	Not recorded	Not recorded	None
9,825	47	Psoriasis NOS, H/O psoriasis	Calcitriol 3 mg/g ointment	19	Not recorded	None
9,856†	35	Psoriasis NOS	Calcipotriol 0.005%/ betamethasone dipropionate 0.05% ointment	Not recorded	Not recorded	None
10,163*	83	Psoriatic arthropathy, H/O psoriasis	Methotrexate 2.5 mg, folic acid 5 mg	6.93	20 January 2014	None
10,734	60	Guttate psoriasis, psoriasis NOS	Betamethasone valerate 0.1% scalp application, Capsal Therapeutic shampoo	3.82	3 September 2013	Simvastatin
10,853*	58	Psoriasis NOS	Methotrexate 2.5 mg, E45 emollient bath oil, Dermol cream, Dovobet gel	12.64	9 December 2013	None
11,081†	25	H/O psoriasis	Balneum 84.75% bath oil, Epaderm ointment	Not recorded	Not recorded	None
11,609	36	Psoriasis NOS	Calcipotriol 0.005%/ betamethasone dipropionate 0.05% ointment	4.24	14 December 2011	None
12,257	44	Psoriatic arthropathy, psoriasis NOS	Paracetamol 500 mg, amitriptyline 10 mg	4.22	22 December 2011	None
12,372†	40	Psoriasis NOS	Dovonex 50 mg/g ointment, Dovobet ointment	Not recorded	Not recorded	None

Patient code	Age (years)	Diagnosis	Psoriasis medication on repeat	JBS 10-year CVD risk	Date CVD risk was recorded	Statin therapy
12,415	38	Pustular psoriasis	Balneum Plus bath oil, Epaderm ointment	3.18	5 September 2012	None
12,764	43	Psoriasis NOS	Diprosalic 0.05%/2% scalp application	5.07	8 March 2013	None

H/O = history of; NOS = not otherwise specified.
*Severe psoriasis patients defined as requiring treatment with phototherapy, systemic agents or hospital admission.
†Psoriasis patients aged 40–74 years whose CVD risk has yet to be adequately assessed.
‡Psoriasis patients with a 20% or greater 10-year risk of developing CVD.

Psoriasis patients and lifestyle risk factors (alcohol and smoking)

Patient code	Age	Alcohol (units/ week)	Alcohol intake status*	Smoking (cigarettes/day)	Smoking status†
429‡	61	0	Trivial	0	Never smoked
441**	29	Not recorded	Light	10	Moderate
548**	42	Not recorded	Not recorded	10	Light
614‡	64	8	Light	0	Ex-light smoker
879**	59	14	Light	0	Ex-light smoker
897	64	Not recorded	Moderate	0	Ex-heavy smoker
1,308	70	Not recorded	Moderate	20	Moderate
2,370‡	47	10	Light	0	Never smoked
2,782‡	39	1	Trivial	7	Light
4,034	54	7	Trivial	0	Ex-heavy smoker
4,095‡.**	50	15	Heavy	15	Light
4,675	65	1	Trivial	0	Never smoked
6,319**	54	Not recorded (alcohol dependence syndrome)	Not recorded	Not recorded	Heavy
6,899	55	9	Moderate	0	Ex-light smoker
6,946‡	63	Not recorded	Light	0	Ex-moderate smoker
6961	57	0	Teetotaller	0	Never smoked
8002††	80	0	Teetotaller	0	Ex-light smoker
8,840	74	1	Trivial	6	Light

Patient code	Age	Alcohol (units/ week)	Alcohol intake status*	Smoking (cigarettes/day)	Smoking status†
9,089	52	12	Not recorded	0	Ex-moderate smoker
9,671††	70	14	Not recorded	0	Never smoked
9,717**	24	Not recorded	Not recorded	0	Never smoked
9,825	47	4	Light	1	Light
9,856**	35	10	Not recorded	10	Moderate
10,163‡	83	0	Teetotaller	0	Never smoked
10,734	60	1	Trivial	0	Never smoked
10,853‡	58	20	Moderate	0	Never smoked
11,081**	25	18	Not recorded	0	Never smoked
11,609	36	Not recorded	Not recorded	0	Never smoked
12,257	44	0	Not recorded	0	Ex-heavy smoker
12,372**	40	Not recorded	Light	0	Never smoked
12,415	38	Not recorded	Light	10	Moderate
12,764	43	1	Trivial	0	Ex-heavy smoker

*Alcohol intake status – teetotaller; trivial: <1 unit/day; light: 1–2 units/day; moderate: 3–6 units/day; heavy: 7–9 units/day.
†Smoking status – never smoked; light: 1–9 cigarettes/day; moderate: 10–19 cigarettess/day; heavy: 20–39 cigarettes/day).
‡Severe psoriasis patients defined as requiring treatment with phototherapy, systemic agents or hospital admission.
**Psoriasis patients aged 40–74 years whose CVD risk has yet to be adequately assessed.
††Psoriasis patients with a 20% or greater 10-year risk of developing CVD.

Psoriasis patients' lipid levels, BMI, blood pressure and diabetes status

Patient code	Age	Cholesterol (mmol/L)	HDL (mmol/L)	BMI	Blood pressure (mm Hg)	Blood pressure status	Diabetes
429*	61	5.5	2.5	26.8	118/72	Normal	No
441†	29	Not recorded	Not recorded	25.62	110/60	Normal	No
548†	42	Not recorded	Not recorded	31.43	112/70	Normal	No
614*	64	6.2	1.7	33.76	144/88	Essential hypertension on medication (ramipril, amlodipine)	No
879†	59	4.8	Not recorded	21.1	125/79	Normal	No

Patient code	Age	Cholesterol (mmol/L)	HDL (mmol/L)	BMI	Blood pressure (mm Hg)	Blood pressure status	Diabetes
897	64	6.1	1.7	38	122/84	Essential hypertension on medication (lisinopril)	No
1,308	70	5.6	1.6	29.05	148/80	Raised	No
2,370*	47	3.8	0.7	30.69	128/80	Normal	Type 2
2,782*	39	5.8	1.1	29.7	110/80	Normal	No
4,034	54	5.5	1.8	29.86	110/60	Normal	No
4,095*†	50	5.1	Not recorded	21.83	128/86	Normal	No
4,675	65	5.7	1.5	31.9	126/80	Normal	No
6,319†	54	6.5	0.9	26.42	120/70	Normal	No
6,899	55	7	1.4	37.45	120/60	Normal	No
6,946*	63	3.5	1.6	24.73	130/60	Normal	Type 2
6,961	57	3.5	1.9	68.4	136/74	Borderline raised	Type 2
8,002‡	80	3.9	1.1	28.62	130/75	Essential hypertension on medication (ramipril)	Type 2
8,840	74	3.6	1.2	31.48	132/71	Raised diastolic	No
9,089	52	6.1	1.1	27.97	120/68	Normal	No
9,671‡	70	5.5	1.5	27.29	132/75	Raised diastolic	No
9,717†	24	Not recorded	Not recorded	27.59	130/80	Normal	No
9,825	47	3.9	0.9	29.75	118/70	Normal	No
9,856†	35	Not recorded	Not recorded	28.5	115/85	Normal	No
10,163*	83	5	2.1	20.03	122/50	Essential hypertension on medication (lisinopril, atenolol, bendroflumethiazide)	No
10,734	60	4.7	1.9	25.89	110/60	Essential hypertension on medication (lisinopril)	No
10,853*	58	5.8	2	26.57	144/80	Borderline raised	No
11,081†	25	Not recorded	Not recorded	42.83	143/78	Raised	No
11,609	36	6.3	1.2	35.81	120/70	Normal	Diabetes insipidus
12,257	44	6.3	1.3	34.58	132/76	Normal	No
12,372†	40	Not recorded	Not recorded	Not recorded	Not recorded	Not recorded	No
12,415	38	5.9	1.4	Not recorded	132/84	Normal	No
12,764	43	5.3	1.1	27.41	118/62	Normal	No

*Severe psoriasis patients defined as requiring treatment with phototherapy, systemic agents or hospital admission.

†Psoriasis patients aged 40–74 years whose CVD risk has yet to be adequately assessed.

‡Psoriasis patients with a 20% or greater 10-year risk of developing CVD.