Thrombotic risk assessment in APS: The Global APS Score (GAPSS)

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Thrombotic risk assessment in APS: the Global APS Score (GAPSS)

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Abstract:

Recently, we developed a risk score for antiphospholipid syndrome (APS) (Global APS Score or GAPSS). This score derived from the combination of independent risk factors for thrombosis and pregnancy loss, taking into account the antiphospholipid antibodies (aPL) profile (criteria and non-criteria aPL), the conventional cardiovascular risk factors, and the autoimmune antibodies profile. We demonstrate that risk profile in APS can be successfully assessed, suggesting that GAPSS can be a potential quantitative marker of APS-related clinical manifestations. Lupus (2014) 23, 1286–1287.

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Introduction

One of the cornerstones of health and clinical research is to identify individuals who have a high risk of developing an adverse outcome over a specific time period, so that they can be targeted for early preventative strategies and possibly treatment. Many prediction models have been developed for cardiovascular disease,1,2 mainly focusing on stroke or ischaemic heart events. More recently, three score systems have been formulated to quantify the risk of thrombosis/ obstetric events in antiphospholipid syndrome (APS), aiming to help physicians to stratify patients according to risk.3–5 The first two scores3,4 focused on the antiphospholipid antibodies (aPL) profile, while the most recent one, The Global APS Score or GAPSS,5 also included the cardiovascular risk factors and autoimmune profile when the risk was computed.

The Global APS Score (GAPSS)

The Global APS Score (GAPSS) was designed and developed in a large cohort of patients with systemic lupus erythematosus (SLE).5 It is derived from the combination of independent risk factors for thrombosis and pregnancy loss. GAPSS takes into account the aPL profile, including criteria6 and non-criteria aPL7 as well as conventional cardiovascular risk factors such as arterial hypertension, smoking, hyperlipidaemia and diabetes and the autoimmune antibodies profile (ANA, ENA and anti-dsDNA) into the equation. The GAPSS was developed and validated in a large cohort of consecutive SLE patients who were randomly divided into two sets by a computer-generated randomized list. The GAPSS was developed in the first set of 106 SLE patients, assigning weighted points proportional to the b-regression-coefficient values to each of the risk factors identified by multivariate analysis (Table 1). In this cohort, higher values of GAPSS were seen in patients who experienced thrombosis and/or pregnancy loss compared with those without clinical events (GAPSS 9.3 4.8 [range 1–19] and 5.3 4 [range 0–16], p < 0.001). The GAPSS was then computed and validated in the second set of 105 patients with SLE. In this validation cohort the results were similar, with statistically higher GAPSS values in patients with a clinical history of thrombosis and/or pregnancy loss compared with those without events (GAPSS 9.5 5.6 [range 0–20] and 3.9 4.1 [range 0–17], p < 0.001). The GAPSS score was also evaluated in a cohort of 51 SLE patients prospectively followed-up.8 In this study, we showed that an increase in the GAPSS during the follow-up (mean 32.94 12.06 months) was seen in those SLE patients who experienced vascular events when compared with those who did not experience such an event with a RR 12.30 (95%CI 1.43–106.13, p ¼ 0.004). Specifically, an increase of more than 3 GAPSS points had the best risk accuracy for vascular events (HR 48 [95%CI 6.90–333.85, p ¼ 0.0001]) in this cohort.8 In order to evaluate the clinical relevance of the GAPSS in patients without an underlying connective tissue disease, we recently performed a study including 62 consecutive patients with primary APS (PAPS).9 In this study, we showed that higher values of GAPSS were seen in patients with PAPS who experienced thrombosis when compared with those with pregnancy loss alone. In addition, we reported that PAPS patients who experienced recurrent thrombotic events showed higher GAPSS when compared with those without recurrences. Interestingly, GAPSS values higher or equal to 11 were strongly associated with a higher risk of recurrences (OR 18.27, 95%CI 3.74–114.5) and seemed to have the best risk accuracy, in terms of sensitivity and specificity. In summary, GAPSS is a score model based on six clinical factors (four aPL specificities, arterial hypertension and hyperlipidaemia) that has been proven to represent the 'probability' or likelihood of having thrombosis or pregnancy loss in SLE. More recently, the clinical relevance of the GGAPSS in patients without an underlying connective tissue disease has also been proven. The strength of GAPSS, when compared with the previous proposed scores, lies in the inclusion of conventional cardiovascular risk factors into the computation. GAPSS may represent a useful tool to assess the thrombosis or pregnancy loss risk for each aPLpositive patient, switching from the concept of aPL as

diagnostic antibodies to aPL as risk factors for clinical events. Needless to say, although promising, its use should be independently validated in prospective cohorts.

Conflict of interest statement

The authors have no conflicts of interest to declare.

References

1 Tzoulaki I, Liberopoulos G, Ioannidis JP. Assessment of claims of improved prediction beyond the Framingham risk score. JAMA 2009; 302: 2345–2352.

2 Collins GS, Moons KG. Comparing risk prediction models. BMJ 2012; 344: e3186.

3 Sciascia S, Cuadrado MJ, Karim MY. Management of infection in systemic lupus erythematosus. Best Pract Res Clin Rheumatol 2013; 27: 377–389.

4 Otomo K, Atsumi T, Amengual O, et al. Efficacy of the antiphospholipid score for the diagnosis of antiphospholipid syndrome and its predictive value for thrombotic events. Arthritis Rheum 2012; 64: 504–512.

5 Sciascia S, Sanna G, Murru V, Roccatello D, Khamashta MA, Bertolaccini ML. GAPSS: The Global Anti-Phospholipid Syndrome Score. Rheumatology (Oxford) 2013; 52: 1397–1403.

6 Miyakis S, Lockshin MD, Atsumi T, et al. International consensus statement on an update of the classification criteria for definite antiphospholipid syndrome (APS). Thromb Haemost 2006; 4: 295–306.

7 Bertolaccini ML, Amengual O, Atsumi T, et al. 'Non-criteria' aPL tests: Report of a task force and preconference workshop at the 13th International Congress on Antiphospholipid Antibodies, Galveston, TX, USA, April 2010. Lupus 2011; 20: 191–205.

8 Sciascia S, Sanna G, Murru V, Roccatello D, Khamashta MA, Bertolaccini ML. Prospective validation of the Global Antiphospholipid Syndrome Score (GAPSS). Arthritis Rheum 2013; 65: S3.

9 Sciascia S, Sanna G, Murru V, Roccatello D, Khamashta MA, Bertolaccini ML. The Global Antiphospholipid Syndrome Score (GAPSS) in primary APS. Rheumatology (Oxford) 2014; in press.

Table 1 The Global Antiphospholipid Syndrome Score (GAPSS)

Factor	Point value*
Anticardiolipin IgG/IgM	5
Anti-β2-glycoprotein IgG/IgM	4
Lupus anticoagulant	4
Anti-prothrombin/phosphatidylserine complex (aPS/PT) IgG/IgM	3
Hyperlipidaemia	3
Arterial hypertension	1

The GAPSS scoring system is derived from the combination of independent risk for both thrombosis and pregnancy loss, and accounted for multiple factors, including the patient's aPL profile, conventional cardiovascular risk factors, autoimmune antibody profile, and thromboprophylactic drug use.[5] The GAPSS can be calculated for each patient by adding the points corresponding to the different risk factors, weighted as shown in Table 1.