

Hughes Syndrome – a new problem?

Sunday 3 September 2006 saw the start of the first international Hughes Syndrome awareness week. Without this event, and the widespread media coverage that accompanied it, many of us would no doubt have remained in blissful ignorance of this previously little known condition. Much of the media's attention at the time focused on sensational claims that many individuals with Hughes Syndrome had mistakenly been told they had Multiple Sclerosis. More on this later!

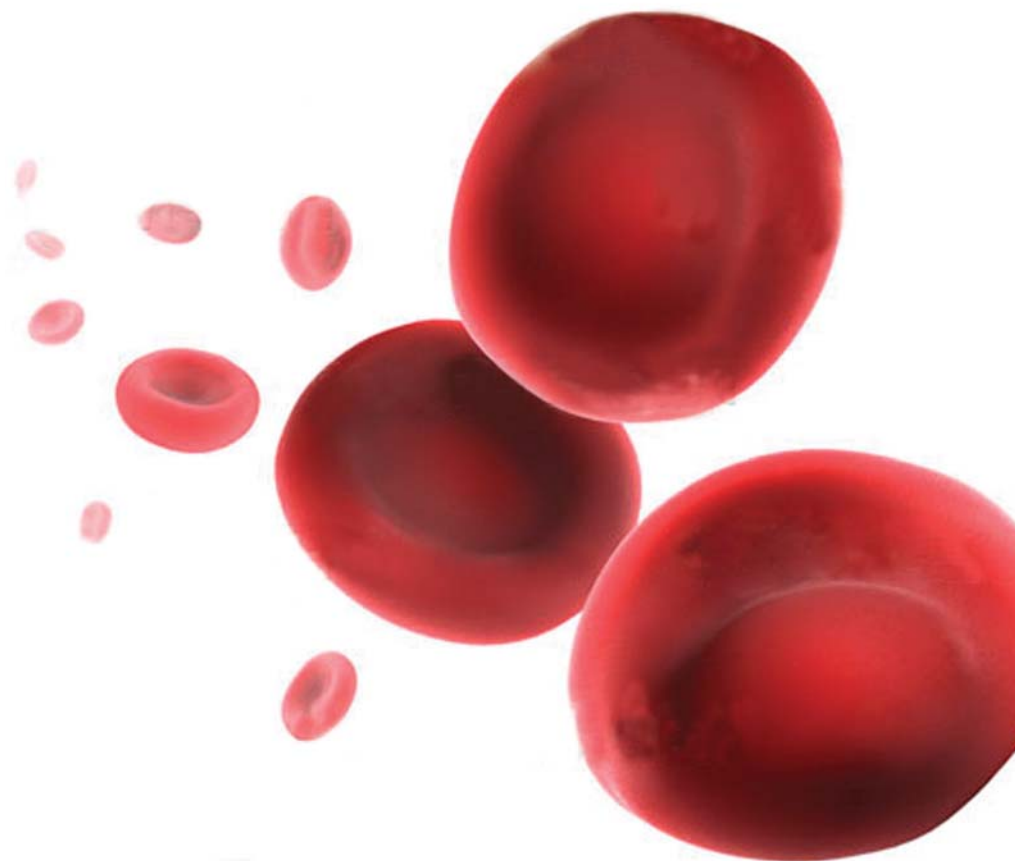
What is certainly safe to say at this stage, however, is that increased awareness of Hughes Syndrome is likely to result in a growing number of people being diagnosed with the condition in future. Given this, it is clearly important to understand what implications this may have for the life and health insurance sector in both an underwriting and a claims context. To answer this question we need first to take a closer look at the condition itself, its symptoms, and its treatment.

What is Hughes Syndrome?

More than two decades ago, in 1983, the British Rheumatologist Dr Graham Hughes and colleagues reported in a medical journal that they had identified a syndrome causing patients' blood to become, as they described it, sticky, increasing the risk of potentially dangerous blood clots forming.

Although the disease can be referred to as Sticky Blood Syndrome or, in honour of its 'discoverer', Hughes Syndrome (HS), it is normally referred to in medical papers by the more technical name of Antiphospholipid Syndrome (APS).

HS, as we shall call it here, is an autoimmune disease characterised by excessive clotting of the blood and by the presence of antiphospholipid antibodies (cardiolipin or lupus anticoagulant



antibodies) in the blood. These antibodies reduce levels of phospholipid binding agents such as β_2 -glycoprotein-I, prothrombin, proteins C and S and annexin V, the latter being a protein that is found in the placenta and vascular endothelium, and has a powerful clot-blocking action.

These antibodies can be found in the blood of individuals without any disease process and have been reported in medical papers as occurring in approximately 1-5% of the normal population. They can also occur briefly in association with a number of infectious conditions such as hepatitis or malaria, and are linked with the use of

certain drugs including antibiotics, quinine and cocaine.

It is vitally important, therefore, that diagnosis should be based on more than just the presence of antiphospholipid antibodies, and that some symptoms or history of conditions linked with HS should also be present.

The syndrome can occur in isolation (primary) or in conjunction with a number of other diseases (secondary). For example antiphospholipid antibodies have reportedly been detected in around half of patients with another immune disease called systemic lupus erythematosus.

What are the clinical manifestations?

Evidence suggests that HS could be responsible for around one in four recurrent miscarriages, one in five strokes in younger people under the age of 45 and one in five cases of deep vein thrombosis (DVT).

The effects of excessive clotting and recurrent thrombosis can be widespread and can affect virtually any system; so those with HS are at greater risk of all of the following:

- Venous thrombosis - particularly of the lower limbs, occurs in around 50% of all cases.
- Lungs – half of those who have venous thrombosis also have pulmonary emboli.
- Retinal thrombosis (eyes)
- Arterial thrombosis - involves the brain in 50% of cases causing stroke and transient ischaemic attack)
- Blood problems (thrombocytopenia – low blood platelet count – haemolytic anaemia)
- Obstetric problems – almost 30% of women who have had more than two miscarriages will have the syndrome
- Heart problems (e.g. heart attack, heart valve disease)
- Skin problems -livedo reticularis – a purple mottling of the skin or ulceration,
- Neurological (seizures, memory loss, migraine, chorea – abnormal movement)
- Multiple sclerosis type symptoms

How is HS diagnosed?

There are two tests which can be used to diagnose Hughes Syndrome. These check for:

- i) anticardiolipin antibodies and
- ii) lupus anticoagulant

Only one of the two tests need be positive to indicate HS, and the range of results goes from weak positive to strong positive.

These tests must be carried out on at least two occasions a number of weeks apart and be positive on each occasion to allow a diagnosis of antiphospholipid syndrome. This is to prevent patients with transient positive tests (due to infection etc) being diagnosed as positive.

Dr Hughes has expressed the view that, these antibody tests should be given to everyone who, presents with symptoms of MS but who also has in their history episodes of recurrent headache, migraine, recurrent miscarriage or previous thrombosis.

Remember however that the diagnosis should be made in the presence of positive laboratory tests and there having been at least one episode of clinical symptoms.

Recent classification criteria, published in 2006, indicate that HS diagnosis requires:

- a) *Vascular Thrombosis* (blood clots) in any organ or tissue
- or *Pregnancy Event*
- one or more miscarriages after 10th week of gestation
 - three or more miscarriages before 10th week of gestation
 - one or more premature births before 34th week of gestation due to eclampsia

and

- b) *Persistently (12 weeks apart) Positive aPL* (lupus anticoagulant test, moderate-to-high titer anticardiolipin antibodies, or moderate-to-high titer β_2 -glycoprotein-I antibodies).

Who is most likely to be affected?

Medical literature indicates that HS occurs more commonly in young to middle aged adults, but can also occur among the elderly. It affects more women than men, particularly in terms of secondary incidence, where it is linked with systemic lupus and other connective tissue disorders which tend to have a female predominance.

Can it be treated?

The key imperative in cases of HS is to prevent the formation of blood clots or the onset of thrombosis. Treatment will often be directed towards thinning the blood. This can be achieved by administering low doses of either aspirin or heparin – or both. Once thrombosis has occurred, the usual treatment is Warfarin. In early pregnancy Warfarin will not be used as this is toxic to the foetus. In around 80% of patients these treatments will bring about a dramatic reduction in symptoms.

Once HS has been diagnosed it is considered unacceptably dangerous to leave it untreated, primarily because of the risk of thrombosis – said to be around 50% over a 10-year period.

Other risk factors such as oral contraceptive use, smoking and hypertension should also be eliminated. However, once treatment has commenced no special limitations need be applied on the patient's activity – although contact sports should be avoided, as should prolonged immobilisation.

How does HS mimic Multiple Sclerosis (MS)?

Multiple Sclerosis can often be inferred as a diagnosis of exclusion. In other words, once other causes have been ruled out, MS may be diagnosed based on a range of symptoms and brain scan results commonly found among people affected by MS.

Clinically there is considerable overlap between HS and MS but, of course, the causes are quite distinct. The following symptoms could suggest either Hughes Syndrome or Multiple Sclerosis:

- Visual problems
- Balance problems
- Loss of sensation

- Muscle weakness
- Mobility problems
- Speech problems
- Memory problems

Both conditions are also associated with abnormal brain scans (MRIs) showing similar white matter plaques or dots.

Given the presence of most or all of the above symptoms, it is easy to see why MS might be diagnosed. In the vast majority of cases, indeed, this would be the correct diagnosis. Should the condition concerned prove to be HS, however, this would be very good news for the person affected – since HS is much easier to treat.

HLRUK Commentary

From the scientific evidence available it is not easy to estimate what percentage of patients may have been misdiagnosed with MS rather than HS. Dr Hughes' team at St Thomas' Hospital reports that in a survey of 250 patients with HS one third of respondents stated that they had originally been told they had MS.

It is difficult to say how – or even whether – such findings can be translated back into a figure representing the percentage of individuals diagnosed with MS who actually have HS. Reported estimates that the figure could be 5%, however, must be regarded as anecdotal.

The Multiple Sclerosis Society has expressed justifiable concerns that reports of this kind could engender false hopes among people with MS, since the vast majority are likely to have been correctly diagnosed. Neurologists writing on the subject to whom we have spoken are now well aware of the issues involved and the tests available.

There remain, however, some inspiring stories of re-diagnosed individuals who have effectively been given their lives back thanks to a revised regime of treatment. Some who were previously wheelchair bound can now walk again. Many of those who have benefited were originally diagnosed some time ago.

One entirely valid point that does clearly emerge from many of the articles written on the subject is that anyone with concerns about their diagnosis should consider getting a second opinion. As Dr Hughes has stressed, the tests are inexpensive to carry out. Of course many doctors will see rarely occurring conditions like HS only once or twice in their lifetimes – so issues like this are inevitable in the world of medicine.

What does this mean for us at underwriting stage?

To be diagnosed with HS/APS individuals will already have suffered from a clinical episode or symptoms in their past, and any acceptance terms will be based on the condition suffered. Our

evaluation must also take account of the syndrome's long-term effects and the likelihood of the patient's continued compliance with their therapy.

For Life Cover only given the data emerging around the mitigation of the associated risks with appropriate therapy, someone with primary HS may represent a better insurance risk now than in previous years. Where the diagnosis is made secondary to others conditions such as systemic lupus this will require very careful consideration.

It is not likely that terms for Critical Illness will be available but all the information submitted should be carefully evaluated before finally deciding.

Similarly for Income Protection only the best cases with clinical presentation of a more minor nature and certainly no renal involvement may be offered terms.

We will keep a watching brief on the subject and as data emerges we will be able to incorporate this into our underwriting evaluations.

We would suggest therefore that any case of HS/APS whether primary and secondary disease should be referred to a Consulting Medical Officer or Hannover Life Re for an opinion.

What does this mean for us at claims stage?

Generally it is business as usual as we will be looking at claims such as stroke or heart attack that are as a result of suffering HS/APS.

However claims for critical illness, where MS has long been a covered condition, will be one of the key areas in which the possibility of an alternative diagnosis needs to be considered.

Claims for MS under income protection could also merit close consideration. A revised diagnosis leading to a new course of treatment in such cases could have a very beneficial effect. Taking a fresh look at this type of claim would be especially worthwhile where the original diagnosis of MS was made some years ago.

At the very least it would seem sensible to ensure that the HS-specific blood tests have been carried out on any claimant with a history of previous thrombosis, recurrent miscarriage, headache or migraine, particularly if it returns in the 30s-40s, or those with a family history of an immune disorder.

In the meantime, as the body of medical knowledge concerning this previously little known condition continues to accumulate, we will no doubt be better able to gain a greater statistical insight into the scale and implications of the misdiagnosis issue to date.

Julie Hopkins
Head of Underwriting and Claims Strategy

Enhanced and Impaired Life Annuities



Introduction

The general public is reasonably familiar with annuity policies. These typically provide policyholders with an income from the time they cease to have a regular income from work until death. Premiums are normally paid as a single premium at retirement.

Individuals who have taken out some form of personal pension arrangement are required to invest the accumulated pension fund, as a single premium, into an annuity. Aptly enough, given their compulsory nature, these contracts are known as Compulsory Purchase Annuities (CPAs).

Until early in 1995 the annuity market offered standard rates only, adjusting purely on the basis of age and sex. As many people reaching retirement age suffer from some kind of illness or disease, that is likely to result in a reduced life expectancy, the insurance industry developed the concept of offering higher annuity payments from CPA funds for impaired lives. Providers initially offered products based on full medical underwriting known as Impaired Life Annuities, subsequently developing so-called Enhanced Annuities based on a simplified underwriting process.

Underwriting for enhanced annuities is now largely questionnaire-based and includes consideration of lifestyle factors as well as covering more than 1,000 medical conditions. Today up to 95% of all enhanced and impaired life annuity applications are assessed using such questionnaires. The remaining 5% typically involve

seldom-occurring medical conditions, and therefore require a General Practitioners Report (GPR). These contracts are covered by impaired life annuities only.

| Enhanced Annuity | Impaired Life Annuity |
|---|---|
| Underwriting based on questionnaire covering lifestyle factors and medical conditions, GPR report typically only to check for over disclosure | Underwriting based on GPR report |
| Can be rated using an automated underwriting system; no further investigation necessary | Individual assessment indispensable; further investigation through GPR report |

Market Survey

In 2006 eight insurance companies offered enhanced or impaired life annuity rates for pension annuity contracts in the UK. By the third quarter of 2005 they accounted for almost 20% by premium value of all annuity policies sold in the open market. Their market share peaked previously in 2003, when almost 28% of annuities were sold at enhanced rates, but dropped again following Britannic Retirement Solutions' closure for new business at the end of 2003.

At the end of 2005, enhanced and impaired life annuity sales had risen to £640 million, up from £600 million in 2004. Although official numbers for 2006 have not yet been published, a further increase in sales is anticipated.

The average size of enhanced or impaired life annuity pensions funds is currently around £40,000. Although roughly two thirds of pension funds amount to less than £20,000, insurance companies are primarily interested in medium-size pension funds, i.e. those between £20,000 and £100,000. These make up more than 50% of single premiums, but only around one third of policies by number.

Enhanced and impaired life annuities are primarily sold through Independent Financial Advisers (IFAs). During the first three quarters of 2005 Watson Wyatt found that 97% of CPAs were sold through IFAs. Although they are bound by their professional code to provide best advice to their customers, IFAs' recommendations still tend to be influenced by factors such as annual income, business relationships between insurer and IFA, insurer's financial strength, and the format of questionnaires. Hence market size could easily be increased if IFAs were to receive ongoing training from enhanced annuity providers.

A wide range of different products are available in the enhanced annuity market. Some providers like Reliance Mutual (smoker annuities) cover niche segments, whilst other providers like Just Retirement offer the full range of qualifying criteria.

The very existence of enhanced annuity providers means that standard annuity providers – whose portfolios consist of a less homogeneous mix of healthy and unhealthy lives – are already selected against. Since only around 50% of annuitants take up the open market option, however, standard annuity providers can still offer better standard terms than their enhanced competitors. So enhanced and impaired life annuity players who wish to increase their share of the enhanced annuity market have to be more competitive than their business rivals in all actuarial areas, i.e. expense structure, investment return and mortality assumptions.

The fact that there are currently only eight enhanced annuity providers reflects the fact that the barriers to entry are high. Capital requirements represent the first major hurdle: since rates are guaranteed, writing annuity business requires substantial capital backing. Secondly, these products contain significant longevity and interest rate risk. Thirdly, if their underwriting systems are to support quick quotations and high volumes, providers must have highly efficient IT platforms. Any new provider must also be able to bring something distinctive and innovative to the market. Their product must be backed by a sound distribution channel and high service standards. Finally, they must be able to react quickly to market changes and able to generate a good level of market awareness.

Underwriting

When underwriting impaired life annuity products, decision-making based on a GPR is almost indispensable. For enhanced annuity business, however, a computer-based underwriting tool can replace the underwriter in most cases. Such underwriting systems should be designed to:

- underwrite and rate qualifying cases whilst rejecting non-qualifying applications
- be usable by lay people without any medical background such as: IFAs, bank staff, call centre staff, and, of course, annuitants themselves when requesting an online quote
- be usable at the point of sale (POS), on a laptop, via the Internet, in the local or head office, and at terminals
- be easily updatable for new medical research that impacts on the underwriting decision-making process
- calculate the amount of the annuity payment

By applying standardised rules to the analysis of all available data, a sophisticated system should be able to come up with the same decision an underwriter would have made. Developing such systems requires active cooperation between medical and IT specialists and actuaries. It is essential to draw up focussed medical questions and carefully consider the validity, importance, and relevance of all the information they will generate. Aside from identifying the presence of a disease, it is also essential to take account of a range of factors – including medication, hospitalisation, duration of treatment – which could affect its likely course. More importantly still for a thorough medical assessment, is the shape of the underlying survival curve. Fortunately, there is sufficient medical data available to model the respective curves for the most severe diseases. Experience data is also essential to modelling the respective curves for any insurance company aiming to be competitive in the enhanced annuity market.

At Hannover Life Re we have been very active in this market segment since it first began to develop. Our thorough understanding of the sales and distribution processes which prevail in the UK enables us to provide tailor-made solutions to suit our clients' individual needs. We have put more than a decade's expertise and experience into a state-of-the-art computer-based underwriting system, which we use for the benefit of both existing and new clients, enabling them to write enhanced or impaired life annuity business profitably.

Reinsurance Concepts

Hannover Life Re supports its clients across a broad front to ensure the success of their enhanced or impaired life annuity products. Depending on the individual client's needs, Hannover Life Re can provide comprehensive product development support – including actuarial, underwriting and marketing – as well as offering risk transfer and financing capacity through reinsurance. Some of the relevant concepts are outlined below.

Quota Share Agreement: Under a quota share agreement the annuity provider and the reinsurer share in all aspects of the underlying business. The reinsurer participates with a pre-determined percentage in all premiums and annuity payments. Since both parties co-operate closely during the development of the new product, a quota share agreement represents a truly shared undertaking –

a great way of aligning the interests of life insurer and reinsurer. A further advantage of quota share agreements is their reduced solvency capital requirement.

Mortality Swap: In an ideal world a life company would never have to pay out more than expected on the annuity products within its portfolio. But even the best actuarial calculations will not necessarily match what happens in reality. Hence swapping actual annuity payments for expected annuity payments has an obvious appeal. A mortality swap evens out mortality experience and mitigates longevity risk.

Risk Premium Reinsurance: This concept is based on separating the risk element of a product from its savings element. Ceding companies are normally well equipped to deal with the savings element and its attendant investment risks; so it makes good sense to reinsure the risk element only.

Financing: There are many reasons why a ceding company might wish to add a financing element to its reinsurance arrangement. These might include:

- covering expenses (product development, marketing activities etc.)
- mitigating the initial valuation strain
- financing the solvency margin
- an annuity provider might also wish to transfer its run-off annuity payment obligations to its reinsurer so that it can use its capital to expand into other business areas

Financing reinsurance agreements often include a recapture option or a deficit account which monitors the repayment of the financing through the emerging cash flows of the reinsured business over time.

Reinsurers normally prefer ceding companies to retain a certain share to ensure that the two parties' interests are properly aligned.

Outlook

Senior executives within enhanced annuity providers believe that up to 40% of annuitants in the open market would be eligible for higher annuity payments due to poor health. In practice, however, only around 20% actually take up this opportunity. So there remains enormous potential for growth in the enhanced and impaired life annuities market.

A variety of external factors are likely to influence future product design. Emerging medical developments are perhaps the most obvious of these. A medical breakthrough leading to a cure for a severe disease like cancer could result in annuity payments being made over much longer periods and hence the need for a significant strengthening of reserves. Obviously the pricing of annuity products should make due allowance for the risk of this happening.

Secondly, technological developments will certainly influence consumer behaviour in all aspects of the life



market. Consumers currently in their mid-50s are already becoming increasingly Internet-aware and computer-proficient. Online quotations will become the norm, making web-enabled computer-based underwriting tools indispensable.

Developments in the social environment will also continue to play a role, with changes in the average household structure and an increased prevalence of divorce influencing both people's views on the importance of annuity products and their ability to afford them.

Domestic regulatory changes, like A-Day 2006 or the publication of the Pensions White Paper, as well as EU initiatives such as the introduction of unisex rates can also be expected to have a significant impact on the enhanced annuity market.

With our extensive knowledge of enhanced and impaired annuity business, Hannover Life Re is certainly well placed to support our clients in this specialised sector of the market. Our experience, which dates back to the sale of the very first enhanced and impaired life annuity policies, gives us a real depth of understanding into the needs of annuitants and the factors to consider in providing products that meet these needs both competitively and profitably. We are ready and willing to work with all our partners to put this experience and insight to mutually beneficial use.

Karin Froehling
Senior Marketing Actuary
Hannover Life Re Germany

Christmas Competition

Congratulations to Jo North, Skandia Life Assurance Limited who won the Race Cups game in our Christmas Competition.

We hope you enjoy **In Focus** and we welcome your feedback, please forward any comments to Kirsteen Grant. If you wish to be added to our mailing list contact Kirsteen on 01 344 846833 or email uk.marketing@hannover-re.com.

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CONTACT