Pharmacoeconomic assessment of specific immunotherapy versus current symptomatic treatment for allergic rhinitis and asthma in France


Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The study examined three treatments for adults and children suffering from allergic rhinitis and asthma. The treatments were current symptomatic treatment (CST), injectable specific immunotherapy (SIT) and sublingual immunotherapy (SLIT). Both injectable SIT and SLIT were given in combination with CST. Injectable SIT and SLIT were given for 3 years in the adult population and for 4 years in the juvenile population.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised two cohorts of patients. One cohort was children over 5 years of age presenting with allergic rhinitis, with or without allergic asthma (juvenile model). The other cohort was young adults over 16 years of age presenting with allergic rhinitis, with or without allergic asthma (adult model).

Setting
The setting was secondary care. The economic study was carried out in France.

Dates to which data relate
The dates to which the resource use and effectiveness data referred were not reported. The costs were derived from 2002 and 2003 databases.

Source of effectiveness data
The clinical data used in the model were:

the proportions of individuals with rhinitis or allergic asthma in the four models (juvenile, adult, dust-mite allergy and pollen allergy),

the distribution of severity levels, and

treatment efficacy (the numbers of improved patients and asthma cases).

Modelling
A decision tree was constructed to simulate the natural history of the disease under each of the three treatments in both
populations under examination (juvenile and adult models). The time horizon was 6 years for the adult population and 7 years for the juvenile population. Allergy could be due to either dust-mites (dust-mite model) or pollen (pollen model). A graphical representation of the model was provided, together with the main assumptions made. Different pathways were considered according to expert opinion.

Sources searched to identify primary studies
Most of the clinical and epidemiological data were based on expert opinion. Some published studies and unpublished reports also provided data, although details of these were not given. In particular, the main source of treatment effect estimates was not clear.

Methods used to judge relevance and validity, and for extracting data
Expert opinion was elicited using a Delphi panel of 11 members (10 allergologists and one epidemiologist). Information on the approach used to identify and select the published studies was not given.

Measure of benefits used in the economic analysis
The summary benefit measures used were the numbers of improved patients and asthma cases. Both measures were obtained using the decision model, on the basis of the pathways followed by patients. No discounting was required.

Direct costs
The cost analysis was carried out from the viewpoint of the French health insurance system. It included the direct medical costs associated with drugs, visits and diagnostic tests. The unit costs and the quantities of resources used were not presented separately. The drug costs came from a published database. Doctors' visits and tests were estimated using tariffs from the French Nomenclature Generale des Actes des Praticiens (NGAP). Resource quantities were based on expert opinion (Delphi panel) and recommendations from both French and international guidelines. The costs were discounted at an annual rate of 3% as long-term costs were evaluated. The price year appears to have been 2003, although this was not explicitly stated.

Statistical analysis of costs
No statistical analyses of the costs were carried out.

Indirect Costs
Productivity costs associated with asthma were considered only in the adult model, the number of workdays lost being derived from a published study. The productivity costs were valued using 2003 average daily allowances for sick-leave, as paid by the French Social Security. The unit costs and the resource quantities were not presented separately. As in the analysis of the direct costs, an annual discount rate of 3% was applied and 2003 costs were used.

Currency
Euros (EUR).

Sensitivity analysis
A univariate sensitivity analysis was carried out to assess the robustness of the model results to variations in economic and epidemiological data. In particular, the official general practitioner's tariff for SIT injection from the NGAP nomenclature was introduced instead of the general practitioner's tariff used as current remuneration by allergologists. Alternative distributions of severity levels were derived from two published studies. Ranges of values defined by the Delphi panel were also used for other clinical data.
Estimated benefits used in the economic analysis
In a hypothetical cohort of 1,000 patients, the numbers of improved patients with CST, injectable SIT and SLIT, respectively, were:

272, 608 and 569 in the juvenile dust-mite allergy model;
158, 689 and 636 in the juvenile pollen allergy model;
230, 570 and 493 in the adult dust-mite allergy model; and
242, 662 and 592 in the adult pollen allergy model.

In a hypothetical cohort of 1,000 patients, the numbers of asthma cases with CST, injectable SIT and SLIT, respectively, were:

564, 362 and 385 in the juvenile dust-mite allergy model;
559, 185 and 193 in the juvenile pollen allergy model;
499, 306 and 341 in the adult dust-mite allergy model; and
420, 191 and 218 in the adult pollen allergy model.

Cost results
The total direct costs with CST, injectable SIT and SLIT, respectively, were:

EUR 1,676, EUR 1,793 and EUR 2,381 in the juvenile dust-mite allergy model;
EUR 842, EUR 1,065 and EUR 1,143 in the juvenile pollen allergy model;
EUR 1,285, EUR 1,361 and EUR 1,783 in the adult dust-mite allergy model; and
EUR 642, EUR 945 and EUR 986 in the adult pollen allergy model.

The indirect costs with CST, injectable SIT and SLIT, respectively, were:

EUR 1,476, EUR 800 and EUR 894 in the adult dust-mite allergy model; and
EUR 1,128, EUR 495 and EUR 560 in the adult pollen allergy model.

Synthesis of costs and benefits
Incremental cost-effectiveness ratios were calculated in order to the combine costs and benefits of the alternative strategies.

The incremental cost per additional improved patient with injectable SIT over CST was EUR 349 for juvenile dust-mite allergy, EUR 420 for juvenile pollen allergy, EUR 224 for adult dust-mite allergy and EUR 722 for adult pollen allergy.

The incremental cost per additional improved patient with SLIT over CST was EUR 2,371 for juvenile dust-mite allergy, EUR 630 for juvenile pollen allergy, EUR 1,899 for adult dust-mite allergy and EUR 892 for adult pollen allergy.

The incremental cost per asthma case avoided with injectable SIT over CST was EUR 583 for juvenile dust-mite allergy, EUR 597 for juvenile pollen allergy, EUR 393 for adult dust-mite allergy and EUR 1,327 for adult pollen allergy.
The incremental cost per asthma case avoided with SLIT over CST was EUR 3,938 for juvenile dust-mite allergy, EUR 824 for juvenile pollen allergy, EUR 3,158 for adult dust-mite allergy and EUR 1,708 for adult pollen allergy.

The sensitivity analysis showed that the base-case results were robust to the variations considered in the sensitivity analysis, except when the official NGAP tariff for SIT injection was used. Under this scenario, injectable SIT became the dominant strategy compared with CST in dust-mite and pollen allergy.

**Authors' conclusions**

Injectable specific immunotherapy (SIT) was a cost-effective treatment in pollen and dust-mite allergic rhinitis and asthma in comparison with current symptomatic treatment (CST). Sublingual SIT was cost-effective in pollen-induced rhinitis, especially in children.

**CRD COMMENTARY - Selection of comparators**

The choice of the comparators appears to have been appropriate. The reasons for comparing SIT with SLIT (i.e. the different tolerability profile) were described. You should decide whether they are valid comparators in your own setting.

**Validity of estimate of measure of effectiveness**

The effectiveness data used in the model were mainly derived from expert opinion, based on a Delphi process. Details of the process were not reported in detail, but it usually represents a rigorous approach to defining clinical inputs. The decision to use expert opinion was justified by the heterogeneity of estimates found in published studies. Some data were also derived from the literature, although details of a systematic search for data were not provided and there was no information on the primary studies. However, the authors stated that the data used in the model reflected the evidence reported in clinical trials.

**Validity of estimate of measure of benefit**

The summary benefit measures were specific and not generalisable to other health care interventions. However, they are commonly used for patients with asthma. Both measures were derived using experts- opinions.

**Validity of estimate of costs**

The analysis of the costs was consistent with the perspective of the analysis. All the relevant categories of costs were included. There was little information on the unit costs and quantities of resources used, which limits the possibility of replicating the analysis in other settings. The sources of the data were reported for all items. The costs were treated deterministically but the impact of using alternative cost estimates was investigated in the sensitivity analysis. The price year was implicitly reported, which will facilitate reflation exercises in other time periods.

**Other issues**

The authors compared their findings with those from a German model and pointed out methodological differences between them. Comparisons with the results from other studies were also made. The issue of the generalisability of the study results to other settings was not explicitly addressed and few sensitivity analyses were carried out. Thus, the results of the study should be considered country-specific. The authors noted that the model did not consider treatment compliance, which might represent a key issue of the analysis. In general, the main limitations of the study appear to have been the weak analysis of uncertainty that would have been improved had a more sophisticated approach (such as a probabilistic analysis) been used, and the use of expert opinion to populate the model.

**Implications of the study**

The study results support the use of SIT for the treatment of allergic rhinitis and asthma. Further epidemiological studies should be undertaken to corroborate the current findings.
Source of funding
None stated.

Bibliographic details

Other publications of related interest
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Subject indexing assigned by NLM

MeSH
Adolescent; Adult; Anti-Allergic Agents /economics /therapeutic use; Asthma /drug therapy /epidemiology /therapy; Child; Cost-Benefit Analysis; Costs and Cost Analysis; Drug Therapy /economics; Economics, Pharmaceutical; France /epidemiology; Health Care Costs; Humans; Immunotherapy /economics; Rhinitis, Allergic, Perennial /drug therapy /epidemiology /therapy; Rhinitis, Allergic, Seasonal /drug therapy /epidemiology /therapy; Treatment Outcome

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