IMPACT OF A DISEASE MANAGEMENT PROGRAM ON CONTROL OF ASTHMA IN NORMANDY:
THE 36 MONTHS RESALIS EXPERIMENT

Launois R,1-2 Salmeron S,3 Lançon F,4 Perez V,5 Gaillhardou M,6 Roy M,5 Magar Y,6 Queniart M,4 Godard P7
Marly Le ROI, France; 5: CPAM de l’Eure NHL, Evreux, France; 6: EduSanté, Vanves, France; 7: Centre Hospitalier Universitaire, Montpellier, France.

INTRODUCTION: Current reforms in the French healthcare aim at improving the quality of care and reducing overall cost. In 1996, they permitted the establishment of experimental healthcare networks, but placed the onus on independent sponsors to provide evidence that such systems improved quality of care and reduced costs. Asthma is a prevalent and costly disease, in which care is often inadequate in spite of the existence of consensus guidelines. That is why it has been chosen for the experiment of a co-ordinated care network.

OBJECTIVES: To assess whether a disease management program of asthma improves the quality of care and reduces costs compared to standard care.

METHODS

FIVE HEALTH PROGRAMS
- Computerisation of the consulting clinics
- Exchange of medical and paramedical records
- Introduction of medical guidelines
- Medical training for doctors
- Patient education

INCLUSION CRITERIA
- Adults and children over 10 years old
- Asthmatic patients regardless of grade, who have given their informed consent and are prepared to attend the educational sessions offered
- Patients who reside in the region of Eure and who do not intend to leave the region within a period of 18 months

STUDY DESIGN
The study design should interfere as little as possible with daily practice. The best suited model is a pragmatic quasi-experimental before-after study with a control group.

PARALLEL SURVEY
A parallel survey was conducted to examine spontaneous changes in costs without an intervention in three contiguous regions. 1 cross section has been realised in both phases.

END POINTS
- Clinical end point: (i) number of follow ups with control during 3 months
- (i) median time to non control
- Quality of life end point: asthma quality of life questionnaire
- Financial end point: (i) cost mean of a 3 months follow up with control and without control
- Economic end point: incremental cost-effectiveness ratio of standard care 3 months follow up and follow up by the network

THRESHOLDS FOR NON-CONTROL OF ASTHMA
The definition of control is based on the 6 criteria and thresholds from the Canadian asthma consensus report.

VALUATION OF DIRECT AND INDIRECT COSTS
- Medical, paramedical, hospital, drug and examination costs were attributed using French Health ministry reference prices in 1999, 2000 and 2001 (NGAP and NABM nomenclatures, PMSI). Lost productivity was calculated from the number of days off work and the annual French daily wage INSEE 1999, 2000.

STATISTICAL ANALYSIS
- Efficacy: (i) mean control rate per patient per quarter (Wilcoxon paired test)
- (ii) median time before non control (Logrank and Cox tests, independent groups)
- Cost: mean cost per patient per quarter of follow up (Wilcoxon paired test)
- Quality of life: mean scores per dimension per patients (Wilcoxon paired test)

RESULTS

PATIENT INCLUSION AND FOLLOW UP
32 doctors downloaded informations about 313 asthmatic patients.
- Before phase: 219 patients had at least 1 consultation before intervention
- After phase: 186 patients followed up for 18 months after intervention
>145 patients followed up during the 2 phases

CLINICAL IMPACT
- Improvement of the mean quarterly control rate per patient: 54% of patients controlled (before phase) vs 65% (after phase) (p < 0.0001)
- Comparison of time spent with controlled asthma before and after intervention:
- At t=0, the probability of keeping a controlled asthma is higher than before the intervention than before (p < 0.0001)
- At t=4, the risk of being non controlled is 4.7 times less important after the intervention than before (Cox model, p < 0.0001)

FINANCIAL IMPACT
- Quantity consumed by the 145 patients followed during the 2 phases:

<table>
<thead>
<tr>
<th>Nature of consumption</th>
<th>Before 145</th>
<th>After 145</th>
<th>GPs of the network 145</th>
<th>After 145</th>
<th>Other GPs 145</th>
<th>After 145</th>
<th>Specialists 145</th>
<th>After 145</th>
<th>Mesures of PEP 145</th>
<th>After 145</th>
<th>Lignes of prescription of anti-asthma drugs 145</th>
<th>After 145</th>
<th>Number of hospitalisation stays 145</th>
<th>After 145</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total costs (€ 2001)</td>
<td>246.7</td>
<td>187.4</td>
<td>235.6</td>
<td>178.1</td>
<td>105.8</td>
<td>93.3</td>
<td>98.3</td>
<td>88.2</td>
<td>58.3</td>
<td>18.8</td>
<td>11.1</td>
<td>9.3</td>
<td>17</td>
<td>4</td>
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<tr>
<td>Direct costs</td>
<td>235.6</td>
<td>178.1</td>
<td>235.6</td>
<td>178.1</td>
<td>105.8</td>
<td>93.3</td>
<td>98.3</td>
<td>88.2</td>
<td>58.3</td>
<td>18.8</td>
<td>11.1</td>
<td>9.3</td>
<td>17</td>
<td>4</td>
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<tr>
<td>Medical costs</td>
<td>71.6</td>
<td>66</td>
<td>71.6</td>
<td>66</td>
<td>105.8</td>
<td>93.3</td>
<td>98.3</td>
<td>88.2</td>
<td>58.3</td>
<td>18.8</td>
<td>11.1</td>
<td>9.3</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>Drug costs (all)</td>
<td>105.8</td>
<td>93.3</td>
<td>105.8</td>
<td>93.3</td>
<td>98.3</td>
<td>88.2</td>
<td>58.3</td>
<td>18.8</td>
<td>11.1</td>
<td>9.3</td>
<td>17</td>
<td>4</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>Anti-asthma drug costs</td>
<td>98.3</td>
<td>88.2</td>
<td>98.3</td>
<td>88.2</td>
<td>58.3</td>
<td>18.8</td>
<td>11.1</td>
<td>9.3</td>
<td>17</td>
<td>4</td>
<td>17</td>
<td>4</td>
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<td>4</td>
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<tr>
<td>Hospital costs</td>
<td>58.3</td>
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<td>58.3</td>
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<td>11.1</td>
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<td>17</td>
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<tr>
<td>Indirect costs</td>
<td>11.1</td>
<td>9.3</td>
<td>11.1</td>
<td>9.3</td>
<td>17</td>
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<td>4</td>
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</tbody>
</table>
| Significant decrease of total quarterly cost per patient of 24% (p < 0.0001)
| No statistically significant difference on the drug costs
| More drug prescriptions and less hospitalisation stays in proportion after the intervention

QUALITY OF LIFE IMPACT
Management in a network significantly improved the patient’s quality of life:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>p</th>
<th>Clinical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities</td>
<td>0.030</td>
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<tr>
<td>Symptoms</td>
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<td>Emotion</td>
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<td>NS</td>
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<tr>
<td>Environment</td>
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<td>NS</td>
</tr>
<tr>
<td>Global QOL</td>
<td>0.100</td>
<td>NS</td>
</tr>
</tbody>
</table>

CONCLUSION: This study demonstrated a significant improvement in the state of health and quality of life of patients, together with a significant reduction in costs following implementation of a co-ordinated network for the treatment of asthma. The reduction in costs is not due to spontaneous national changes in management practice for asthmatic patients, as demonstrated by cost evolution on the parallel survey, and is thus likely to be explained by the intervention program. This initiative is the first attempt to implement a desease management program in France. It is a very promising and enriching experiment, which open a new road for pragmatic evaluation of the management of asthma in primary care with “trickle” inclusions and follow ups.