L'emploi d'aerosols de ribavirine lors d'infection a virus respiratoire syncytial est-il justifie: evaluation clinique et economique [Respiratory syncytial virus infections and ribavirin treatment: clinical and economic evaluation]
Ventura F, Cheseaux J J, Cotting J, Guignard J P

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
Use of ribavirin aerosol for treating respiratory syncytial virus (RSV) infection.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis; Cost-consequences analysis.

Study population
Children at risk for respiratory infection meeting ribavirin treatment inclusion criteria of the Committee on Infectious Diseases of the American Academy of Pediatrics. The ribavirin group and control group had identical inclusion criteria.

Setting
Secondary care. The study was conducted in Lausanne, Switzerland.

Dates to which data relate
The effectiveness data were derived from a single study conducted during the six winters between 1990 and 1995. Dates to which resources and price data relate were not specified.

Source of effectiveness data
Effectiveness data were derived from a single study. The effectiveness data for the ribavirin group were derived from a retrospective study conducted during the four winters between 1990 and 1993. The effectiveness data for the control group were derived from a prospective study conducted during the winters 1993-94 and 1994-95.

Link between effectiveness and cost data
It is likely that the costing was undertaken retrospectively on the same patient sample as that used in the effectiveness study.

Study sample
The study population consisted of two groups of 22 children each. The ribavirin group consisted of patients treated by ribavirin aerosol and support treatment (mean age 2.5 months) who had been admitted for treatment during the winters 1990 to 1993 and who were selected by means of the criteria of the Committee on Infectious Diseases of American Academy of Pediatrics. The control group had been admitted during the winters 1993-94 and 1994-95 (mean age 5
months). These patients were treated by support treatment alone and were selected by using the same inclusion criteria.

**Study design**
The study was a non-randomized trial in a single centre with a retrospective study for the ribavirin group and a prospective study for the control group. The distribution between treated and untreated patients was determined by means of winters during which the Respiratory Syncytial Virus (RSV) infection occurred.

**Analysis of effectiveness**
Analysis was based on intention to treat. The authors used hospitalisation and support treatment periods and mortality as effectiveness measures. Comparability of demographic and baseline characteristics among treatment groups was assessed by two scores: clinical gravity score at admission and risk factor scores.

**Effectiveness results**
The clinical gravity score at admission and risk factor scores for the two groups were identical. The ribavirin group spent almost twice as much time in hospital as the control group (14.2 versus 8.2 days, \(P=0.002\)) with much more time in intensive care units (7.2 versus 0.2 days, \(P<0.001\)). More support treatment was necessary for the ribavirin group as regards respiratory physiotherapy (3.8 versus 2.7 sessions a day, \(P=0.026\)), the duration of oxygen-therapy (7.3 versus 3.7 days, \(P=0.03\)) and the number of children requiring respiratory assistance (4 versus 0 children, \(P=0.116\)). Two severe bronchospasms and one death occurred in the ribavirin group, none in control group. Concerning the death, no association with ribavirin treatment was found.

**Clinical conclusions**
The administration of antiviral ribavirin treatment results in longer hospitalisation and support treatment for respiratory syncytial virus (RSV) infected children, aggravating the clinical evolution of the RSV infection.

**Measure of benefits used in the economic analysis**
The authors did not include a summary measure of health benefit, although mortality was one of the health outcomes assessed (assumed to be equal). As such it is appropriate to classify the economic analysis as cost-consequences according to the clinical outcomes reported in the effectiveness results.

**Direct costs**
Direct costs included the ribavirin cost, hospitalisation costs, intensive care unit costs, and respiratory physiotherapy costs. The perspective adopted was not clearly stated. It is likely that the cost data were based on real costs in the authors' hospital. Costs and quantities were not reported separately. Discounting was not applied but may not be relevant given the study periods.

**Statistical analysis of costs**
Not undertaken.

**Indirect Costs**
Not stated.

**Currency**
French Francs (Ffr). (US dollars are quoted in the English abstract only).
Sensitivity analysis
Sensitivity analysis was not carried out.

Estimated benefits used in the economic analysis
The ribavirin group spent twice as much time in hospital as control group (14.2 versus 8.2 days, \( P=0.002 \)) with an intensive care unit period much longer (7.2 versus 0.2 days, \( P<0.001 \)) than control group. More support treatment was necessary for the ribavirin group in terms of respiratory physiotherapy (3.8 versus 2.7 sessions a day, \( P=0.026 \)), the duration of oxygen-therapy (7.3 versus 3.7 days, \( P=0.03 \)) and the number of children requiring respiratory assistance (4 versus 0 children, \( P=0.116 \)). In terms of side-effects, two severe bronchospasms occurred in the ribavirin group. The clinical study showed no difference in mortality between the treatment alternatives. One death occurred in the ribavirin group, and none in control group, although ribavirin treatment was not an attributable cause.

Cost results
The daily hospitalisation cost was Ffr5,384 for the ribavirin group and Ffr3,024 for the control group. The total hospitalisation cost was 3 times higher in the ribavirin group than in control group (Ffr77,612 versus Ffr25,784). In the clinical unit site of the study, savings from the cessation of ribavirin treatment would amount to Ffr1,140,216 for 2 years.

Synthesis of costs and benefits
Costs and benefits were not combined as the authors concluded that the ribavirin treatment was both less effective and generated higher costs. If one assumes mortality to be the measure of benefit then the intervention and the comparator are equally effective and the analysis can be regarded as a cost-minimization exercise. However, in this case the clinical outcomes adopted may be considered as a proxy for effectiveness.

Authors’ conclusions
As hospitalisation and support treatment were longer in the ribavirin treatment, resulting in much higher costs and aggravation of the clinical evolution of the RSV infection, the authors concluded that the ribavirin aerosols are not a relevant therapeutic alternative for the treatment of RSV infection of inferior respiratory airways.

CRD COMMENTARY - Selection of comparators
The rationale for the choice of the comparator was clear.

Validity of estimate of measure of benefit
The effectiveness of ribavirin was not clearly stated. The effectiveness outcomes chosen (hospitalisation and support treatment duration) are unlikely to represent valid estimate of effectiveness measures as they appear in both consequence and cost arguments. Morbidity and mortality should perhaps be considered as the only valid measures of effectiveness. Furthermore, it is not clear from the study whether or not ribavirin treatment had an impact on the clinical evolution of the disease. With these concerns in mind the most appropriate classification of this study, as indicated in the abstract, is as a cost-consequences analysis.

Validity of estimate of costs
Resource quantities were not reported separately from prices and inadequate details of methods of quantity and cost estimation were given. No details of cost sources were provided.

Other issues
In terms of an economic evaluation the study was more focussed on the cost of the intervention. The generalisability of the results was not assessed and more detail could have been given on the cost analysis as costs and quantities are...
probably specific to the hospital site or to the Swiss health care system.

**Implications of the study**
The authors’ conclusions that ribavirin aerosol is not a cost-effective treatment with respect to support treatment only may need to be supported by a more appropriate effectiveness measure.

**Source of funding**
None stated.

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**Other publications of related interest**

**Indexing Status**
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