STUDY REPORT SUMMARY

ASTRAZENECA **PHARMACEUTICALS**

FINISHED PRODUCT: NA
ACTIVE INGREDIENT: NA

Study No: NIS-RDK-DUM-2005/1 NCT 00272727
Improved quality of the treatment and increased compliance in asthmatics through the dialog tool ´Soren´ – between patient and caregiver.

Developmental phase: NA
Study Completion Date: May 2007
Date of Report: 2 March 2009

OBJECTIVES:

The purpose of the study was to investigate if the effect of education tailored to the individual patients needs, would affect the asthma control as a result of increased compliance.

METHODS:

A 6 months, single centre, open-label, crossover study involving 98 patients with asthma. Half of the patients were randomised to early intervention while the other half of the patients started the same intervention after 12 weeks. The intervention took place at 3 occasions at the lung clinic. There were 3 assessment visits and an optional telephone contact in the study.

The intervention

The intervention consisted of education tailored to the individual patients needs. It was based on a dialog tool consisting of 6 questions about patient self-efficacy and outcome expectancy. A physician or clinic nurse carried out the intervention in a lung clinic.

Any recommendation in change in the patient's medical treatment was given according to GINA guidelines.

Segmentation of the patients

During the 1st visit, the patient was asked questions about his/her knowledge about asthma, including symptoms, treatment, prevention and medication. The patient's answers formed the basis of segmentation into three different types of asthma patients with regards to self-efficacy and outcome expectancy.

Target patient population and sample size

The study included 98 male and female patients, 18-45 years of age, with diagnosis of asthma ≥ 3 moths and prescribed daily use of inhaled glucocorticosteroid. The patients should be able to speak and understand Danish.

Exclusion criteria were asthma exacerbation within the last month and/or participation in another clinical trial within the last month.

Criteria of evaluation

The primary efficacy variable in this study was asthma control measures by ACQ (Asthma Control Questionnaire).

Secondary efficacy variables included quality of life (AQLQ, Asthma and Quality of Life Questionnaire), ability to follow prescription, lung function and inflammation.

Statistical methods

Analyses were carried out using SPSS (version 13.0). All hypothesis testing used two-sided alternative hypotheses and p-values less than 5 % were considered statistically significant.

RESULTS:

Patient flow

A patient was regarded as completing the study, when he/she completed the 3rd visit. Overall 67,3 % (n = 66) of the patients completed the study and table 1 shows the patient flow with regards to intervention groups.

Table 1 **Patient flow according to the intervention group (percentage is calculated in relation to the total number in the present column)**

Visit #	*Early intervention (n)*	*Late intervention (n)*	*Total*
1st visit	49	49	98 (100%)
	Withdrawal = 9	Withdrawal = 7	
2nd visit	40 (81,6 %)	42 (85,7 %)	82 (83,7 %)
	Withdrawal = 6	Withdrawal = 10	
3rd visit	34 (69,4 %)	32 (65,5 %)	66 (67,3 %)

Table 1 shows the patient withdrawal according to randomisation i.e. early or late intervention. There were about the same number of patients who had discontinued the study in the two intervention groups after the 3rd visit, which means 34 patients in early intervention group and 32 patients in late intervention group respectively completed the program.

The patient flow table indicate no remarkable difference between the two intervention groups.

Results of demographic characteristics

A total of 98 patients were included in the analysis. Half of the patients (n = 49) were randomised to early intervention, and the other half (n = 49) was randomised to late intervention.

Patient demographic characteristics are shown in table 2.

Table 2 Demographic characteristics

	Categories	*Early Inter-vention*	*Late Inter-vention*	*Total*	*Total mean (SD)*
Sex	Male	18	26	44 (44,9 %)	
	Female	31	23	54 (55,1 %)	
	Total	49	49	98 (100 %)	-
Age	18-29 years	15	21	36 (36,7 %)	
	30-39 years	22	17	39 (39,8 %)	
	40-45 years	12	11	23 (23,5 %)	
	Total	49	49	98 (100 %)	32,3 (7,5)
Duration of (years) diagnosed asthma	0-4 years	15	14	29 (29,6 %)	
	5-9 years	14	12	26 (26,5 %)	
	10-19 years	8	11	19 (19,4 %)	
	≤ 20 years	12	12	24 (24,5 %)	
	Total	49	49	98 (100 %)	11,5 (9,9)
Severity of asthma[1]	Mild	12	12	24 (24,5 %)	
	Moderate	23	17	40 (40,8 %)	
	Severe	14	20	34 (34,7 %)	
	Total	49	49	98 (100 %)	-
Smoking status	Non-smoker	31	30	61 (62,2 %)	
	Previous smoker	7	5	12 (12,2 %)	
	Smoker	11	14	25 (25,5 %)	
	Total	49	49	98 (100 %)	-
Patient segmentation[2]	Type A	21	21	42 (47,2 %)	
	Type B	16	8	24 (27,0 %)	
	Type C	10	13	23 (25,8 %)	
	Total	47	42	89 (100 %)	-

The intervention groups were balanced in terms of demography and baseline characteristics (i.e. no significant differences between none of the parameters and the two intervention groups using a χ^2-test).

[1] Evaluated by the physician according to GINA guidelines
[2] Assessed by the physician at the patients 1st visit at the clinic

Results of the primary variable

The primary variable in this study was ACQ and the score values in the three visits are presented in table 3.

Table 3 ACQ score

ACQ score	*Groups*	*n*	*Mean*	*SD*	*Range*
1st visit	Early intervention	46	1,02	0,63	0-2,43
	Late intervention	48	1,13	0,74	0-3,29
	All patients	94 (95,9 %)	1,08	0,69	0-3,29
2nd visit	Early intervention	38	0,91	0,64	0-2,29
	Late intervention	39	0,89	0,66	0-2,71
	All patients	77 (78,6 %)	0,90	0,65	0-2,71
3rd visit	Early intervention	33	0,82	0,68	0-3,43
	Late intervention	32	0,85	0,58	0-3,00
	All patients	65 (66,3 %)	0,84	0,63	0-3,43

A Students T-test for equality of means showed no significant difference between the mean changes in ACQ score for the patients in the early and late intervention groups (table 4).

Table 4 T-test of the mean change in ACQ score for the intervention groups

Change in ACQ score		*n*	**Mean change**	*SD*	*Levene´s Test for Equality of Variances*		*T-test for equality of means*		
					F-test	*p*	*t*	*df*	*p*
1st to 2nd visit	Early	37	-0,11	0,73	0,000	0,990	0,298	74	0,767
	Late	39	-0,15	0,72					
1st to 3rd visit	Early	32	-0,17	0,95	0,168	0,683	0,428	62	0,670
	Late	32	-0,26	0,80					

Results of secondary variables

In the following, the results of the secondary variables are presented.

AQLQ

The score results from the questionnaire regarding the patients' quality of life are shown in table 5.

Table 5 AQLQ score

AQLQ score	*Groups*	*n*	*Mean*	*SD*	*Range*
1st visit	Early intervention	42	5,57	0,74	3,62-6,63
	Late intervention	45	5,71	0,77	2,64-6,66
	All patients	87 (88,8 %)	5,64	0,76	2,64-6,66
2nd visit	Early intervention	35	5,78	0,61	3,91-6,64
	Late intervention	38	5,89	0,62	3,83-6,71
	All patients	73 (74,5 %)	5,83	0,61	3,83-6,71
3rd visit	Early intervention	30	5,97	0,65	4,29-6,65
	Late intervention	32	6,04	0,64	4,00-6,73
	All patients	62 (63,3 %)	6,01	0,64	4,00-6,73

A Students T-test for equality of means showed no significant difference between the mean changes in AQLQ score for the patients in the early and late intervention groups (table 6).

Table 6 T-test of the mean change in AQLQ score for the intervention groups

Change in AQLQ score		*n*	**Mean change**	*SD*	*Levene´s Test for Equality of Variances*		*T-test for equality of means*		
					F-test	*p*	*t*	*df*	*p*
1st to 2nd visit	Early	31	0,17	0,58	0,549	0,461	-0,206	65	0,838
	Late	36	0,20	0,77					
1st to 3rd visit	Early	27	0,33	0,95	0,725	0,398	0,134	56	0,894
	Late	31	0,30	0,84					

Ability to follow prescription

The results from the VAS-score from the three visits can be seen in table 7.

Table 7 VAS-score

VAS score	*Groups*	*n*	*Mean*	*SD*	*Range*
1st visit	Early intervention	49	76,84	21,13	20-100
	Late intervention	49	79,39	14,20	40-100
	All patients	98 (100 %)	78,11	17,96	20-100
2nd visit	Early intervention	40	86,50	13,70	50-100
	Late intervention	42	85,71	14,17	40-100
	All patients	82 (83,7 %)	86,10	13,86	40-100
3rd visit	Early intervention	34	89,12	18,32	0-100
	Late intervention	32	90,63	9,48	70-100
	All patients	66 (67,3 %)	89,85	14,62	0-100

There are no significant differences between the mean change in VAS-score from the 1st to 2nd visit or 1st to 3rd visit for the intervention groups (table 8).

Table 8 T-test of the mean change in VAS-score for the intervention groups

Change in VAS-score		*n*	*Mean change*	*SD*	*Levene´s Test for Equality of Variances*		*T-test for equality of means*		
					F-test	*p*	*t*	*df*	*p*
1st to 2nd visit	Early	40	9,50	20,75	0,502	0,481	0,744	80	0,459
	Late	42	6,43	16,50					
1st to 3rd visit	Early	34	13,24	21,70	5,633	**0,021***	0,309	55,239	0,759
	Late	32	11,88	13,30					

* The null hypothesis regarding equality of variance has been rejected, but the T-test for equality of means is not significant (p = 0,759)

Lung function

The results of the spirometry measurement of FEV_1 (% prediction) are listed in table 9.

Table 9 FEV_1 (% prediction)

FEV_1 (% prediction)	*Groups*	*n*	*Mean*	*SD*	*Range*
1st visit	Early intervention	49	95,41	16,91	27-119
	Late intervention	49	91,90	12,25	66-118
	All patients	98 (100 %)	93,65	14,80	27-119
2nd visit	Early intervention	40	98,45	12,36	72-118
	Late intervention	42	94,55	13,00	65-116
	All patients	82 (83,7 %)	96,45	12,77	65-118
3rd visit	Early intervention	34	99,18	12,52	76-119
	Late intervention	32	95,91	14,49	68-122
	All patients	66 (67,3 %)	97,59	13,51	68-122

A Students T-test showed no significant differences between the mean changes in FEV_1 (% prediction) between the intervention groups from neither 1st to 2nd visit nor 1st to 3rd visit (table 10).

Table 10 T-test of the mean change in FEV_1 (% prediction) for the intervention groups

Change in FEV_1 (% prediction)		*n*	**Mean change**	*SD*	*Levene´s Test for Equality of Variances*		*T-test for equality of means*		
					F-test	*p*	*t*	*df*	*p*
1st to 2nd visit	Early	40	3,95	11,895	0,173	0,679	0,946	80	0,347
	Late	42	1,90	7,237					
1st to 3rd visit	Early	34	4,94	11,662	0,363	0,549	0,379	64	0,706
	Late	32	3,97	8,932					

Inflammation

The results of the patients exhaled nitric oxide (FeNO) values are shown in table 11.

Table 11 FeNO values

FeNO	*Groups*	*n*	*Mean*	*SD*	*Range*
1st visit	Early intervention	49	25,73	24,24	7,00-158,70
	Late intervention	49	22,95	27,16	5,00-152,70
	All patients	98 (100 %)	24,34	25,65	5,00-158,70
2nd visit	Early intervention	40	22,00	14,53	7,40-72,40
	Late intervention	42	24,27	24,61	8,20-165,00
	All patients	82 (83,7 %)	23,16	20,24	7,40-165,00
3rd visit	Early intervention	33	20,59	14,80	5,90-86,00
	Late intervention	32	21,41	19,15	8,20-118,10
	All patients	65 (66,3 %)	21,00	16,95	5,90-118,10

There were no significant differences in the mean change in FeNO value between the intervention groups (table 12).

Table 12 T-test of the mean change in FeNO value for the intervention groups

Change in FeNO value		*n*	**Mean change**	*SD*	*Levene´s Test for Equality of Variances*		*T-test for equality of means*		
					F-test	*p*	*t*	*df*	*p*
1st to 2nd visit	Early	40	-3,57	20,57	0,018	0,893	-0,586	80	0,559
	Late	42	-0,75	22,81					
1st to 3rd visit	Early	33	-6,27	17,52	0,025	0,874	-0,150	63	0,881
	Late	32	-5,51	22,91					

Eos

The results of the eosinophil granulocyte concentration (eos) in the blood samples are presented in table 13.

Table 13 Eos values

Eos value	*Groups*	*n*	*Mean* ($\times 10^{-9}$)	*SD* ($\times 10^{-9}$)	*Range* ($\times 10^{-9}$)
1st visit	Early intervention	27	0,2174	0,1728	0,04-0,69
	Late intervention	35	0,2031	0,1507	0,03-0,053
	All patients	62 (63,3 %)	0,2094	0,1595	0,03-0,69
2nd visit	Early intervention	21	0,2400	0,2145	0,02-1,04
	Late intervention	27	0,1833	0,1075	0,05-0,41
	All patients	48 (49,0 %)	0,2081	0,1636	0,02-1,04
3rd visit	Early intervention	9	0,2178	0,1414	0,03-0,40
	Late intervention	9	0,2056	0,1380	0,07-0,43
	All patients	18 (18,4 %)	0,2117	0,1357	0,03-0,43

There were no significant differences in the mean change in eos value between the early and the late intervention group (table 14).

Table 14 T-test of the mean change in eos value for the intervention groups

Change in eos value		*n*	**Mean change** ($\times 10^{-9}$)	*SD* ($\times 10^{-9}$)	*Levene´s Test for Equality of Variances*		*T-test for equality of means*		
					F-test	*p*	*t*	*df*	*p*
1st to 2nd visit	Early	21	1,23	13,47	1,968	0,167	0,668	46	0,495
	Late	27	-0,96	8,62					
1st to 3rd visit	Early	8	-8,25	14,68	1,550	0,232	-1,060	15	0,306
	Late	9	-2,00	9,35					