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A transition clinic model for inflammatory bowel disease between two tertiary care centers: outcomes and predictive factors

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Abstract. – OBJECTIVE: Few models of transition have been proposed for inflammatory bowel disease (IBD). The aim of the present study is to evaluate the feasibility of a transition model and the predictive factors for success/failure.

PATIENTS AND METHODS: Patients with low activity or remission IBD were enrolled. Proposed model: three meetings every four-six weeks: the first one in the pediatric center (Bambino Gesù Children's Hospital); the second one, in the adult center (Foundation Polyclinic University A. Gemelli), with pediatric gastroenterologists; the last one, in the adult center, with adult gastroenterologists only. Questionnaires included anxiety and depression clinical scale, self-efficacy, quality of life, visual-analogic scale (VAS). Transition was considered successful if the three steps were completed.

RESULTS: Twenty patients were enrolled (range 18-25 years; M/F: 12/8; Ulcerative Colitis/Crohn's Disease 10/10); eight accepted the transition program, four delayed the process and eight refused. Patients who completed transition generated higher scores on the resilience scale, better scores on well-being perception, and had lower anxiety scores. Patients who failed transition were mostly women. The perceived utility of the transition program was scored 7.3 on a VAS scale.

CONCLUSIONS: The proposed transition program seems to be feasible. Psychological scores may help in selecting patients and predicting outcomes.

Key Words:
Ulcerative colitis, Crohn's disease, Self-efficacy, Quality of life, Children.

Introduction

Crohn's Disease (CD) and Ulcerative Colitis (UC) are chronic diseases affecting children and adolescents in up to 25% of cases[1]. The early age incidence is increasing, typically with more extensive and severe forms when compared to adulthood[2]. Reaching the adulthood, this growing cohort of patients needs to undergo a very "special moment", the transfer from the pediatric center to the adult one. They have to move from a center where the care management refers to parents, to another where the care management is referred to the patients themselves. The chronic nature of these diseases, characterized by an alternation of exacerbation and remission, and the high associat-

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ed morbidity, makes the transition to the adult clinic an obligated step. This step is a delicate moment, and no standardized protocols exist up to now[3].

Research in other disciplines (rheumatic diseases, cystic fibrosis, diabetes mellitus type 1) shows that a structured program correlates with a better compliance, a better control of patient's disease and higher satisfaction[4]. In inflammatory bowel disease (IBD) this process should start at the pediatric center and should provide the young people with the necessary tools and the appropriate knowledge to make them independent in managing their disease[5].

Only a few models of transition clinics have been described for IBD, and almost none arising from the Italian cohort. A model of transition is proposed in this study, involving two tertiary centers for pediatric and adult IBD: Bambino Gesù Children's Hospital and Fondazione Policlinico Gemelli IRCCS. The aim of the study is to assess the feasibility and effectiveness of the proposed transition model. Furthermore, as secondary objective, the possible predictors for success/failure of the transition are analyzed.

Patients and Methods

Patients

Patients were enrolled based on the following inclusion criteria: diagnosis of CD or UC, according to current guidelines from European Crohn's and Colitis Organization (ECCO) and European Society for Paediatric Gastroenterology Hepatology and Nutrition (ESPGHAN), remission or low activity disease, age ≥18 years old, and follow up of at least 2 years in the pediatric center. The disease was considered stable when no significant clinical variations were found in the last 4 weeks before the T1 visit (variation greater than 3 points at clinical Mayo score for UC patients or higher than 3 at Harvey Bradshaw index for CD patients). Exclusion criteria were age <18 years and patients refusing to fill out the questionnaire or rejecting the transition process. The clinical characteristics of the study population and the enrolled patients are summarized in Table I and II, respectively. Ethical approval was obtained from local institutional review board (protocol number P/491/CE/2011). The transition was proposed to candidate patients between January and June 2015.

The Transition Clinic Model

The proposed transition model consists of three meetings/visits, fixed about 1 month apart, involving patients and pediatric/adult caregivers.

Table I. Characteristics of the studied population.

		Patient at T0 (% of total)
Male/Female		12/8
Mean age		20.2 (± 1.76)
Type of disease CD/UC		10/10
Time at OPBG		5 (± 2,23)
Age at diagnosis		15.2 (± 3.44)
Number of IBD centers changed following the diagnosis		1.3 (0.57)
surgery		10 (50%)
IBDQ		171.36 (± 35.59)
Previous treatment		
1. biologics		4 (20%)
2. immuesuppressants		12 (60%)
3. steroids		20 (100%)
4. antibiotics		5 (25%)
5. mesalamine		19 (95%)
Current treatment		
1. biologics		4 (20%)
2. immunesuppressants		5 (25%)
3. steroids		3 (15%)
4. antibiotics		0
5. mesalamine		12 (60%)
Montreal classification		
CD	A1	6 (30%)
	A2	4 (20%)
	A3	0
	L1	0
	L2	3 (15%)
	L3	6 (%30%)
	Upper disease	1 (5%)
	B1	5 (25%)
	B2	4 (20%)
	B3	1 (5%)
	P	3 (15%)
UC	E1	1 (5%)
	E2	2 (10%)
	E3	7 (35%)
	S0	0
	S1	2 (10%)
	S2	7 (355)
	S3	1 (5%)

The first visit (T1) is performed at the children's hospital, when the transition is "officially" proposed and explained. The second meeting (T2) is performed in the adult center, in the presence of both adult and pediatric gastroenterologists. The last meeting (T3) takes place at the adult unit with the adult gastroenterologist. The third meeting is still a dedicated visit, but carried out in complete independence and autonomy, similarly to the setting of the adult IBD clinic. Questionnaires are administered during the three visits. Physicians need to complete an independent questionnaire. The proposed model is described in Figure 1.

Table II. Characteristics of the enrolled patients.

	Success at T2	Failure at T2	*p*-value	Success at T3	Failure at T3	*p*-value
M/F	8/3	1/4	0.106	8/0	0/3	0.001
Mean age at transition	20.45 (± 1.63)	19 (± 1)	0.09	20.62 (± 1.84)	19.14 (± 0.89)	0.07
CD/UC	6/5	1/4	0.308	6/2	1/6	0.041
Follow up at OPBG	5 (± 1,94)	5,8 (± 2.16)	0.337	5,57 (± 1.98)	5.28 (± 2.05)	0.778
Mean number of other hospitals previuos to OPBG	1.36 (± 0.67)	1.2 (± 0.44)	0.631	1.37 (± 0.74)	1.14 (± 0.37)	0.470

Definition of Transition Outcomes

The transition was considered successful when the three meetings were completed. Failure could occur at each visit, and it was defined as the patient's unwillingness to go through the process or as not showing up at the appointment.

Questionnaires for patients:

During the first visit (T1), the patient was asked to fill the following questionnaires:

- HADS (anxiety and depression clinical scale)
- GSES (Generalized Self-Efficacy scale)
- CD-RISC (Connor-Davidson scale)
- IBDQ (IBD quality of life Questionnaire)
- VAS (visual-analogic scale) to evaluate respectively:
  - the current state of patient's health
  - disease activity in the last week
  - patient's personal perception about the independence in the disease management
  - confidence in the pediatric physician/team
  - grade of comprehension perceived about the adult physician/team
  - confidence in the adult physician/team

During the visits T2 and T3, the patient was asked to fill in only a few of the VAS.

HADS (The Hospital Anxiety and Depression Scale)

This test consists of l4 items exploring depression and anxiety. The timeframe analyzed is that of the previous two weeks, and for each answer there is a numerical score, expressed on a 4-point scale (0-3). The total score is obtained by

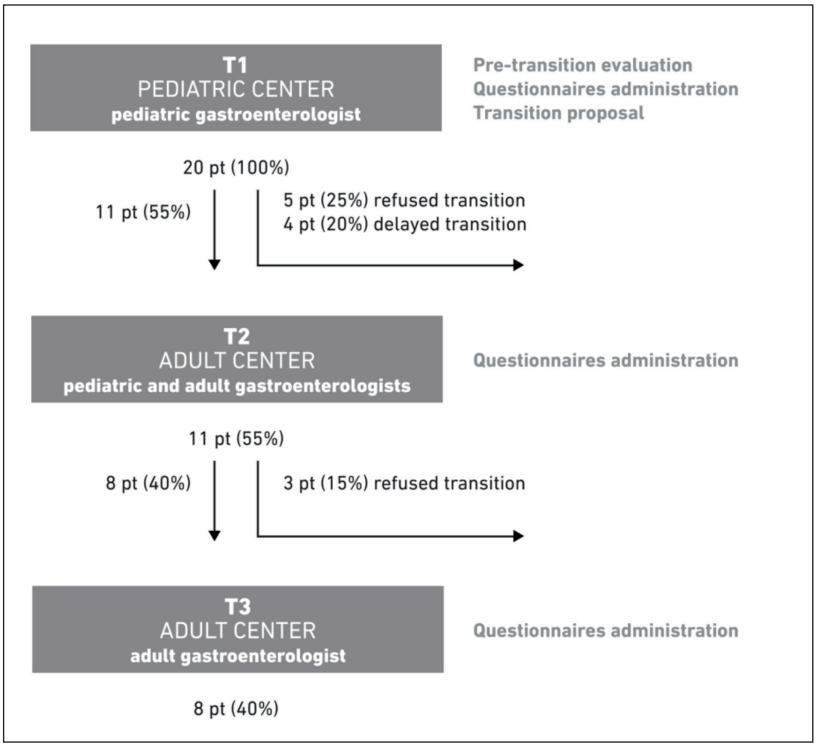

Figure 1. Chart of the proposed model and main outcomes.

summing up each item, and it ranges from 0 to 21 for anxiety or depression each. A score between 0 and 7 for each subscale can be considered normal. A score equal to or greater than 11 indicates the likely presence of a mood disorder. A score between 8 and 10 is suggestive of the presence of the state explored[6].

Generalized Self-Efficacy

The GSES was created to measure the perceived self-efficacy. Self-efficacy is defined as one's belief in one's ability to succeed in specific situations or accomplish a task[7]. The first version of the scale was created in Germany by Jerusalem and Schwarzer (1986) and consisted of 20 items, later reduced to 10 items (Jerusalem, Schwarzer, 1986; Schwarzer and Jerusalem, 1989, 1995). The GSES is a one-dimensional scale and uses a Likert scale of four steps (1 = "not true" to 4 = "completely true"). Individual differences are explored in terms of motivations, attitudes, learning and task performance. There are 10 items in total, and the maximum score is therefore 40. The higher the score, the greater the self-efficacy. The Italian version has been translated and validated by Sibilia, Schwarzer, Jerusalem (1995) [8].

CD-RISC

This scale is used to assess the resilience. The authors Connor and Davidson define resilience as "the ability to thrive also in difficult moments"[9]. According to the authors, it can be considered as a measure of stress-management capability. The CD-RISK, in the proposed version, is composed of 25 items, each based on a 5-point scale: (0) almost never true, (1) rarely true, (2) is true sometimes, (3) often true, (4) true in almost all cases. The score can thus vary between 0 and 100. The higher the score, the greater the level of resilience[9].

IBDQ

The questionnaire aims to evaluate the quality of life of patients with IBD, in reference to the last two weeks prior to completing the questionnaire. The quality of life is indeed a subjective index of perceived health. This questionnaire has proved to be a valuable tool that reflects important changes in health status and can also be used in clinical trials to measure the effectiveness of therapy. The questionnaire consists of 32 items that explore four dimensions: a) intestinal symptoms (10 items); b) State of emotional health (12 items); c) systemic symptoms (5 items); d) social functions (5 items). For each item, the patient is asked to express their opinion using a 7-point Likert scale (1 - worst function to 7 - best function). The higher the score, the better the quality of life of the patient. The minimum possible score is 32, the maximum 224[10,11].

Statistical Analysis

Database was imported in the IC STATA12 statistical software for MAC. The descriptive analysis was conducted with the support of the MICROSOFT EXCEL software for the creation of graphs and charts. The inferential analysis was performed using non-parametric tests for continuous variables: Spearman rank correlation test, and Mann-Whitney test. The hypothesis was rejected for alpha $p<0.05$.

Results

Feasibility of the Model

The present model was proposed to 20 patients, as potential candidates for transition. At the end of the first meeting, 5 patients refused the transition, while 15 patients were favorable (Figure 1). Four patients from the latter group were qualified as unstable during the T1 visit, according to a clinical evaluation, and pediatricians postponed their transition. These four patients were not considered in further analysis. The transition was continued with 11 patients (55% of the enrolled patients). Three patients refused to continue with the third visit (T3). A total of 8 patients (40%) completed the proposed model of transition.

The visits were organized properly, and no major problems were encountered during the process. For these reasons, the proposed model appeared to be feasible.

All patients enrolled in the program and called back for a delayed questionnaire appointed 7.3 on a 0-10 VAS scale to the utility of the transition program. Ninety percent of the contacted patients were glad about this experience and would repeat it again or suggest it to other patients (data not shown).

Disease Awareness and Knowledge of the Transition Process in Candidates of the Transition Clinic

Overall, the patients displayed a high perception of their independence in managing the disease and about the transition process (Figure 2A and 2B), in particular, by an average score of 77 on a 1 to 100 VAS of the perception of independence, and 2.42 of the readiness to transfer (tak-

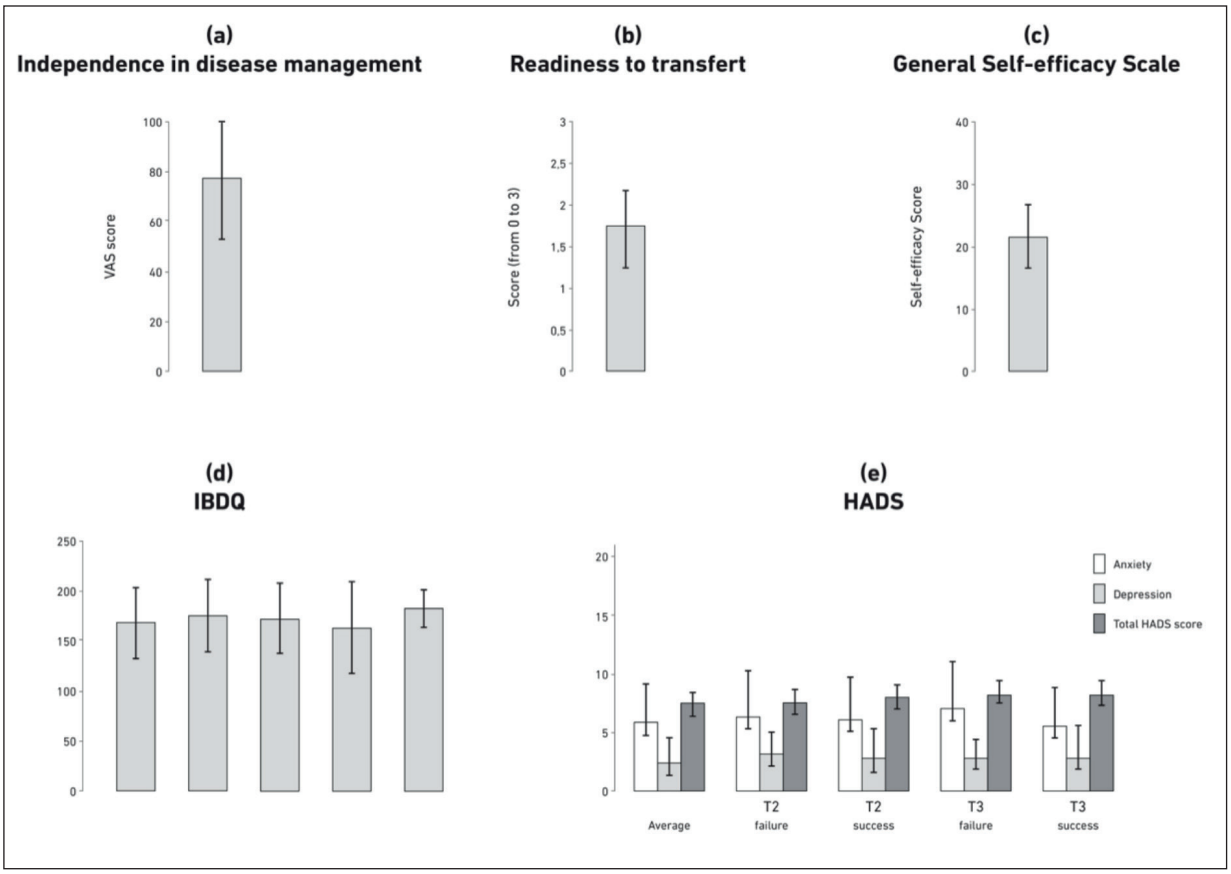

Figure 2. Disease awareness and knowledge of the transition process in candidates of the transition clinic (**A**-**C**). Multiparametric evaluation of patients and predictor factors of success for the proposed transition clinic process (**D**-**E**).

en from a Likert scale of four steps from 0 "disagree" to 3 "agree"). They displayed high trust in the physician, both pediatrician and the adult gastroenterologist with a mean value 90 (scores expressed on a 1 to 100 VAS). There are no differences in confidence between the pediatrician and the adult gastroenterologist in either T2 or T3 (data not shown). The average score, based on the total number of patients in the questionnaire designed to measure the generalized self-efficacy, is of 27.75/40 points (Figure 2C).

Multiparametric Evaluation of Patients and Predictor Factors of Success for the Proposed Transition Clinic Process

Classifying patients into failure and success of the transition process, a higher average score for trust in physician was found in success compared to failure ($p<0.05$).

The quality of life, assessed by IBDQ, was higher in success at T3 (185.37 points) compared to the total average (171.36 points) and failure at T3 (165.14 points) ($p<0.05$) (Figure 2D). These results paralleled with the perceived well-being measured by VAS scale (data not shown).

None of the patients generated any significant scores for anxiety and/or depression. When assigning patients to either failure or success, higher scores on the anxiety scale were registered in the failure group (6.25) compared to the success group (5.5) (Figure 2E). On the depression scale, although the scores relating to failures were slightly higher, the results did not show any statistical significance.

Self-efficacy assessment showed that higher scores were observed in patients failing the transition at T2 and at T3 compared to success ($p<0.05$).

More consistent results emerged from the analysis of the CD-RISC. In particular, success at T2 and at T3 showed a higher total score (70 points at T2 and 69.62 points at T3) compared to groups failing the transition at T2 and at T3 (60.2 points and 62.85 points, respectively).

This is more evident in the domains of personal responsibility - tenacity (23.72 points in T2 success group and 23.12 points in the T3 success group, 18.6 points in T2 failure group and 19.85 points in the group of failures to T3), in self-confidence (20.36 and 20.75 points in successful groups at T2 and at T3, 17 points in failure at T2 and 28 points of failure groups at T3) and that relating to the acceptance of the positive changes (14.45 and 14.85 for successful groups at T2 and at T3; 13.6 and 13.57 points for the groups who rejected the transition at T2 and at T3, respectively). Less significant are the differences observed in the domains related to the spiritual influences and control.

Discussion

The present study shows the real situation of two tertiary care centers in Italy. The proposed transition model has been designed taking into account the recommendations by the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN)[12] and considering the most recent major European and American pieces of evidence[13]. The structure of the program and the results were also compared with the recommendations by the Joint Expert Panel attended by the Italian Society of Paediatric Gastroenterology, Hepatology and Nutrition (SIGENP), the Italian Association of Hospital Gastroenterologists and Endoscopists (AIGO), the Italian Society of Endoscopy (SIED), and the Italian Society of Gastroenterology (SIGE).

The patients enrolled were homogeneous in age and clinical features. The proposal was accepted by 75% of patients, and we have completed the transfer of 40% of them. The sample size is small and the analyzed timeframe is short. This could influence the outcomes, considering the remitting-relapsing nature of IBD. The literature sources have underlined the importance for this process to occur in a stable phase of the disease, and therefore 5 amenable patients were postponed in this series.

At the beginning of the transition program, patients with CD and UC were equally represented, while patients who completed the transition program had CD (statistically definitive). Similarly, patients who completed the program were males, while at the beginning of the program there were 12 males and 8 females (statistically definitive). Patients who completed the program were older than those that failed in the process (difference about one year).

The study analyzed the perception of patients about the necessity of the transfer and their knowledge of the disease. Patients expressed a positive feedback when asked to judge their own perception of the transfer readiness. The independence perception was also positive. The trust placed by the young adult patients in the doctor was an important element in determining the success or failure of the transition.

To analyze predictive factors for success or failure, the success/failure at T2 and T3 were compared. The quality of life, assessed by IBDQ, was higher in successfully transferred patients at T2 and T3 compared to patients not responding to the proposal. The difference is significant considering the quality of life to be a subjective index of perceived health. It might be useful to propose the transfer to a stage where this perception is high. Similar results were obtained in evaluating the perception of the patients' well-being, which was greater in the success groups.

When analyzing the psychological characteristics of patients through the specific questionnaire (HADS), none of the patients had a significant score for anxiety and depression. In the group of transfer failure at T2 and T3 the scores relating to anxiety scale were slightly higher.

Another potential predicting factor for transition's effectiveness was the perceived self-efficacy, as measured on the scale of generalized self-efficacy. This enables to assess the individual differences in terms of motivation, attitudes, learning and task performance. In the present study, a higher score was observed in patients who had rejected the transition at T2 or at T3. This appears to be the only aspect mostly present in failure groups. This result may suggest that the patients who have not completed the transition are considered to be more independent and therefore feel less need to resort to a structured path.

Some interesting results were obtained using the CD-RISC. This scale is used to assess the resilience, as "personal ability to thrive in face of difficulty". Patients that passed the transition at T2 and at T3 generated higher average scores than groups that rejected the transition. Furthermore, patients respondent to the transition were more tenacious, had greater self-confidence, and therefore they could better manage negative emotions and have a greater positive acceptance to changes.

Regarding the "medical evaluation questionnaire", some interesting data have emerged about

the different assessment expressed by pediatrician and gastroenterologist: the pediatrician is more generous in the evaluation of their patients, and tends to assign higher scores. Only for the questions on the readiness to transfer, the scores given by the adult gastroenterologist are similar but slightly higher than the pediatrician's. The most important difference is related to the doctor-patient relationship's quality. As expected, the pediatrician's score differs from the adult gastroenterologist's, generating a higher value, since it is based on a mutual trust and understanding, built over time. In addition, the initial judgment by the pediatrician regarding the transfer readiness is consistent with what has been observed. Patients who complete the first and the second meeting at the adult hospital are considered more ready, as well as more prepared with an understanding of the transition process. As a result, this can highlight an important role of the transition program in increasing disease knowledge, and in the perceived transfer readiness, expressed by the upward trend of the scores assigned by the patient to the specific questions.

Conclusions

The proposed transition program seems to be feasible and effective. However, it is necessary to expand the sample size and apply a long-term follow up. The most difficult patients to be transferred are female with UC, who feel autonomous and independent and place less faith in the adult doctor. Their health and well-being at the time of the transfer is lower than that of the transferred patients.

The patients who complete the transition have different psychological characteristics: they appear to be less anxious, more tenacious, and more responsive to changes. These characteristics may be useful in discriminating the positive or negative response towards the transition and could be considered to better prepare patients for transfer.

The goal of the transitional path is to ensure the continuity of care, taking into account the physical, social and emotional development of the patient. A successful transitional program should promote adherence to treatment, expand the knowledge of the disease, and encourage the patient's autonomy in managing it independently, with the aim of improving or maintaining a stable control of the disease.

Author Contributions

Scaldaferri, Romeo, De Angelis and Ricca designed the work, performed the follow up visits and drafted the manuscript. Angelino revised the final draft of the manuscript and edited figures and tables. Ricca, Filoni, Ferrarese, Borrelli and Camardese administered and interpreted the psychological questionnaires. Scaldaferri, Filoni, Torroni, Faraci, Rea, Giorgio performed the follow up visits and acquisition and interpretation of clinical data. Lopetuso, Pizzoferrato, and Gaetani contributed to the acquisition and interpretation of clinical data. Poscia performed statistical analysis. Gasbarrini and Dall'Oglio contributed to design of the work and supervised the study. All Authors critically revised the manuscript for important intellectual content. All Authors approved the final version of the manuscript.

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Conflict of Interests

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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