Psychological implications of living with familial adenomatous polyposis

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Abstract

Background and study aims : **Psychosocial implications of living with FAP remain largely unexplored. This article reviews available literature on three topics : 1) Implications of living with FAP 2) genetic testing and reproductive decision-making and 3) family communication.**

Patients and methods : **Papers published until 2009 about psychosocial and behavioral issues in FAP were identified.**

Results : **Psychometric data indicate that FAP patients and at-risk relatives as a group do not exhibit *clinical* symptoms of mental health problems after clinical or genetic diagnosis. However, some subgroups revealed to be more vulnerable to distress. Also, concerns related to the disease and its consequences were reported.**

While interest in prenatal diagnosis or preimplantation genetic diagnosis seems to be high it is important to study actual uptake because this may reveal to be much lower.

Family members are an important source of information and the few available data suggest that family communication is problematic.

The findings described have several shortcomings. They were obtained from only a few studies often conducted using specific or mixed study groups, originating from the 90ties and mostly cross-sectional in nature.

Conclusions : **For clinical practice, it is important to have more research data on how FAP patients at different ages cope with the disease, on the impact of genetic testing on reproductive decision-making and on family communication. Results reported here need to be confirmed by additional research and new themes need to be explored.** (Acta gastroenterol. belg., **2011**, 74, **438-444**).

Introduction

Familial Adenomatous Polyposis (FAP) is a relatively rare genetic disorder accounting for only about 1% of cases of colorectal cancer. This hereditary cancer syndrome is characterized by the presence of hundreds, even thousands of adenomatous polyps in the colon and rectum starting to develop at puberty. When left untreated, these adenomatous polyps will inevitably lead to colorectal cancer by the age 35-40 years. Surgery – mostly performed in the late teens to early twenties – is currently the only effective treatment to prevent progression to colorectal carcinomas. The increased risk of other manifestations such as pouch adenomas, duodenal polyps or desmoid tumours warrants lifelong surveillance for these patients even after colon surgery (1).

During the last decades, the clinical manifestations, genetics, medical management and treatment of FAP have been increasingly studied and understood. In contrast, psychosocial implications of living with FAP remain largely unexplored. Studies in the context of other hereditary cancer syndromes such as Hereditary Breast and Ovarian Cancer (HBOC) and Lynch Syndrome (2-8) can be very useful to understand psychosocial issues potentially related to FAP. It is however important to denote important differences which make it difficult to extrapolate experiences from one domain to another. *First of all*, FAP has a specific clinical phenotype caused by mutations in the APC-gene. As a result, a patient receiving a clinical diagnosis of FAP is also confronted with a genetic diagnosis –and its implications as well –, even when the genetic test result reveals to be inconclusive. *Secondly*, since penetrance is nearly 100%, a person receiving a positive genetic test result will definitely develop the disease within a certain (mostly limited) number of years. For these patients, it is generally agreed that preventive surgery is the standard method of care. So, when clinical and/or genetic diagnosis of FAP is established, persons will face the psychological burden of being undoubtedly confronted with a serious, chronic disease for which preventive surgery and long-life follow-up is warranted. *Lastly*, although FAP is considered a "late-onset" disease, the expression of the disease occurs at a young age i.e. puberty or early adolescence and childhood testing is considered standard good practice. Consequently, the psychological impact of testing children for FAP needs special attention.

This article reviews available literature on three topics : 1) Implications of living with FAP 2) genetic testing and reproductive decision-making and 3) family communication.

Implications of living with FAP

A FAP diagnosis confronts the person with the perspective of living with a chronic, potentially life threatening disease. Persons have to undergo and cope with the consequences of (preventive) surgery and they face lifelong surveillance afterwards. How people react and adjust to a FAP diagnosis depends of course on many

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factors such as experience with the disease in the family, illness perceptions, stage at diagnosis, or age. Especially age is an important element to consider since many FAP patients or persons at-risk will be confronted with the disease and the need to undergo invasive surgery at a young age.

Response to diagnosis and distress

Retrospective studies reporting on initial responses to diagnosis revealed profound immediate reactions to diagnosis such as "a feeling that life would never be the same", anger, anxiety, fear of death and crying. Afterwards, concerns related to the illness remained such as anxiety about future health, guilt or worry about transmitting a genetic disease to one's children, awareness about one's body appearance or even concerns about compromised attractiveness (9-12). These concerns did however not seem to have a severe impact on overall well-being (12). Moreover, psychometric data on psychological distress (i.e. psychoneuroticism, anxiety) and stress specifically related to FAP were generally found to be in the range of the general population indicating that FAP patients as a group do not exhibit clinical symptoms of mental health problems (10,12). There is also no evidence of increased psychiatric symptomatology or increased prevalence of specific psychiatric disorder in FAP patients (13). Nevertheless, some subgroups may be more vulnerable to distress such as women or patients being diagnosed recently (12) or FAP patients with desmoid tumour (11). The latter study revealed a reduced health-related quality of life for adults with FAP and desmoid tumours compared to previous studies reporting positive quality of life in adults with FAP. The authors suggest that there may be specific issues or burden associated with desmoid tumours including treatment difficulties, its uncertainty in its course and potential life threatening impact, feelings of isolation because of a lack of understanding and lack of information from health care professionals.

These findings illustrate that further identification of subgroups of patients, more vulnerable to impaired well-being, can be helpful since it enables health care providers to target evaluation, counseling and intervention to those in need.

Illness representations : perceived seriousness and perceived control

How individuals perceive a disease can have an important impact on emotional and behavioral reactions (4).

Research revealed that FAP patients and relatives at-risk talk about the disease in terms of "polyps in the colon". Implicitly, people were aware of the malignant nature of the disease but explicit reference to it was not made which may reflect a taboo on "cancer" within FAP families (10).

Several findings also suggest that FAP patients tend to minimize the seriousness of the disease. Patients perceived FAP less serious than their relatives (10) and also carriers of a mutation perceived FAP less serious than non-carriers (14). A similar phenomenon was observed by Miller *et al.* (12) who reported that the majority of patients said that many people with polyposis are a lot worse off than themselves and that "compared to the problems other people have, my own ones don't seem so bad" or "having polyposis is not my worst problem". In another study of Michie *et al.* (15) FAP families talked about living with FAP as being "no problem". In the same line, Levitt *et al.* (13) suggested that FAP patients may be less likely to think about or worry about their illness compared with other medically ill populations. It has been suggested that a psychological defense mechanism is at work here in order to safeguard the self-image. Minimization is in this case used to manage emotional responses to a health threat (10,14,15). In contrast, it may also illustrate an actual adaptation to living with the disease since attitudes towards having polyposis were linked to the length of time since diagnosis : those who had been diagnosed more recently were likely to hold more negative attitudes about their illness (12). Additionally, the preventive options available – increasing a sense of control – may also reduce the perceived seriousness of the disease and consequently the intensity of negative emotions since cancer can in fact largely be prevented in the case of FAP.

In contrast to most other genetic cancer syndromes, FAP is a disease in which colorectal cancer can actually be prevented. Nevertheless, FAP patients themselves considered FAP as a less controllable or treatable disease when compared to some other patient groups scoring their illness (e.g. rheumatoid arthritis, diabetics, chronic fatigue syndrome). The hereditary nature of the disease (which as fixed) may account for this (10).

Further research can be helpful to test the above hypotheses, to gain more insight into how illness representations relate to emotional responses and into which coping strategies FAP patients use to cope with the disease and its consequences.

Knowledge and information needs

Little is known about the level of knowledge about FAP and information needs of FAP patients. A recent study (9) revealed that FAP patients were satisfied with the level of information they received regarding FAP and the most preferred sources to obtain FAP-related information were experts on FAP (9). One needs to consider, however, that there still may be substantial gaps in knowledge about FAP (10). Moreover, there were unmet support needs primarily regarding anxiety about the children's risk, fear of developing cancer and uncertainty about the impact of FAP (9).

The importance of information provision is strengthened by the finding that providing thorough and accurate information was associated with more positive psychological well-being (12). An interesting finding in that

study is also that, having received information from the affected parent resulted in less illness-related concerns i.e. lower fear about their future health and feeling less guilty (12). Family communication, especially by the affected parent, may thus be important in the adjustment to the illness.

Prophylactic surgery and surveillance behaviors

In order to prevent the occurrence of colorectal cancer in FAP patients, prophylactic proctocolectomy is recommended at a young age. Currently, different surgical procedures are available with regard to intestinal reconstruction : procedures that restore bowel continuity (ileorectal anastomosis (IRA) or ileopouch anal anastomosis (IPAA)) or – although exceptional – permanent ileostomy. Even if it is standard care to perform preventive surgery of the colon, the type of surgery and the timing of the surgery are often decided upon within the context of a shared-decision making process. It would be interesting to know more on how patients perceive these surgical options and on how the decision-making process takes place. Additionally, parents are faced with decisions regarding surgery in their children. They need to decide on the timing of surgery and on which treatment option will offer the greatest benefit in proportion to the burden. Such a decision is made through a collaborative process with the physicians. Data on whether and how children are involved in the decision-making process and on how children psychologically respond to this would be very helpful for clinical practice.

Apart from surgical decision-making, little is known about surveillance behavior in FAP patients and the psychological impact of regular screening. Giarelli (16) studied self-surveillance behaviors and the emotions associated to it in a study population including FAP patients. She described that FAP patients engaged in self-surveillance behaviors and that this became more elaborated and sophisticated with age. Self-surveillance behaviors included pharmacological management, tracking changes in physical manifestations, monitoring of dietary and fluid intake and the impact on the body, laboratory and treatment recording and tracking the frequency and adherence to scheduled follow-up visits. These behaviors were associated with negative and positive emotions before and after surveillance behavior. Emotions predominantly present before self-surveillance were the need to control and understand fear, vulnerability and worry. After self-surveillance patients reported less worry, they were relieved, felt in control and were satisfied but some patients continued to report the same negative feelings as before. There may be a concern that negative emotions may reduce engagement in self-surveillance behaviors but there was no evidence for this in this study. This is in line with health behavior theories such as Leventhal's self-regulation theory (17) explaining that negative emotions may facilitate effective life-long management because they can motivate surveillance behavior resulting into reassurance.

Michie *et al.* (15) reported on experiences of FAP patients with bowel screening. This procedure was associated with distress resulting from the aversive nature of the procedure itself and the concerns about the outcome. This anxiety builds up in the week before the hospital visit but was relieved at the time of the hospital visit.

To our knowledge, only one study is available on the use of colorectal surveillance tests by FAP patients before surgery (18). This recent cross-sectional study on surveillance behaviors among members of FAP and AFAP families indicated that use of colorectal endoscopy prior to surgery was inadequate among affected FAP or AFAP patients. Lack of patient recall of professionals' recommendation was an important predictor of not recently having these tests. Persons not enrolled in a cancer registry also reported lower screening rates. In this study, only a minority of patients reported barriers of screening including "dislike the preparation for the procedure" and "protracted pain or discomfort following the procedure".

Future research is needed on how FAP patients are followed up after surgery and on adherence to surveillance of the upper-gastrointestinal tract.

To our knowledge, no data are available on the use and impact of regular screening in children with FAP. Colonoscopy in children can be performed under general anesthesia, also because of the anxiety at the prospect of the procedure being performed without a general anesthetic (19). As with other conditions of children with disabilities or chronic disorders, the time around diagnosis is probably a key milestone for parents. Notwithstanding the fact that there has been research on the impact of genetic testing on the level of distress of parents of children at risk (see next section), other difficulties are probably also important to study in order to learn more about the needs and the type of support that should be offered to these parents. We think of measurements looking at domains such as parents' information needs, the extent to which parental input is elicited and the extent of parental involvement in decision-making about the care of the child (20).

Genetic testing and reproductive decision-making

With the identification of gene mutations predisposing to familial cancer syndromes and consequently the availability of genetic testing, interest has grown in the psychological impact and impact on decision-making of these genetic tests. There are only limited data available regarding genetic testing for FAP despite the fact that the impact of genetic testing is likely to be disease specific (4) and studies including Lynch Syndrome and HBOC can therefore not be generalized for several reasons as explained before.

Genetic testing of children

There is a general consensus not to test children for late-onset diseases such as hereditary breast or colon cancer. Exceptions are made for diseases such as FAP for which medical interventions are warranted before the legal age of 18 that is usually used as a cut-off to test genetically. But, also in the case of testing children for FAP, there is general consensus not to test before the age of 10-12 years (in the absence of clinical symptoms) since there are no medical benefits and there is a potential detrimental psychological impact.

Patient or parent attitudes, however, seem to differ from these professional guidelines. Both in the study of Whitelaw *et al*. (25) and in a recent study of Andrews *et al*. (9) parents preferred testing children at birth or early childhood, but many considered the age of 10 years or older the most suitable age to inform children about polyposis. The main reasons to test provided by the parents were personal, psychological reasons expressing the removal of ambiguity about the disease status of the children – which was experienced as stress inducing – and satisfying parental curiosity. Up to now, it remains unclear whether the benefits of avoiding potential psychological harm by not testing young children or children at birth for FAP outweigh the expected psychological benefits on which parents focus if children can be tested at a young age. One single case report is available regarding this issue (26) and based on its results the authors conclude "a hypothesis that urgently needs addressing in controlled studies : Complying with requests for predictive DNA testing (including pre- and post-test counseling) in parents wishing to reduce uncertainty about their children's future health is associated with good psychological outcomes regardless of the test results".

For current knowledge about the impact of predictive genetic testing in minors for FAP, we rely on two longitudinal studies (27-29) reporting on short- and long-term psychological effects. Both studies found that predictive genetic testing of children between 6 and 16 years did not result in clinically significant psychological symptoms or behavioral problems at short-term or long-term follow-up in children or their parents. Nonetheless, there are some mediating factors that need to be considered in relation to distress in children such as having an affected mother and siblings' test results. For parents, mixed results in their children seemed to be particularly distressing. This illustrates the importance of family dynamics and the social context to understand adjustment to genetic testing.

Genetic testing of adults

More insight into the psychological impact of predictive testing in adults can be retrieved from two studies : a comparative longitudinal study on the effects of predictive DNA testing for late onset disorders (24,30-32) and a cross-sectional multi-center study (14,29). It remains difficult to make clear conclusions from these studies since different measures have been used leading to different outcomes. Dudok DeWit *et al*. (24,30-32) generally found no particularly high cancer-specific distress levels or general distress levels (anxiety, depression) before or after genetic testing. In their studies, test result did not predict post-test distress. Michie *et al*. (14,29) however reported a distressing impact of receiving positive genetic test results but scores were generally not in the clinical range and one has to consider mediating and moderating factors. For example, the negative emotional impact of positive genetic test results in terms of general anxiety was greater for those who felt distressed about FAP in the family, perceived FAP more serious and perceived the genetic test to be more accurate.

In line with other recent studies on the impact of genetic testing for HBOC or Lynch-syndrome (for reviews see 2-7) one probably may conclude that it is more important to consider other factors than the genetic result to understand emotional responses in relation to genetic testing for FAP. It remains to be determined what the important factors are in the context of FAP.

Reproductive decision-making

FAP has an autosomal dominant inheritance pattern. The chance a child of an affected parent will have the mutation, and will therefore be affected by FAP is 50% in every pregnancy. One of the advantages of the availability of genetic tests is that it can assist couples in their reproductive decision-making. Unfortunately, this will only be the case for a part of the FAP patients and at-risk relatives since in about 10% to one third of FAP families no mutation can be detected yet (33). Additionally, reproductive decision-making can be complicated by existing desmoid tumours or the potential negative impact of surgical procedures on fertility.

Up to now, it remains unclear what proportion of FAP patients opts for one of the different alternatives available such as whether to refrain from having children of their own, whether to avoid the birth of an affected child, whether to use assisted reproduction technologies, whether to undergo an abortion after prenatal diagnosis, or whether to consider adoption.

The impact of FAP on reproductive decisions has been studied by Denayer *et al*. (10) before the implementation of predictive genetic testing. In this study, for half of the persons who were aware of the genetic risk at the time of the reproductive decision-making, the awareness of the risk had an impact on the reproductive decision-making. Some were initially in doubt to have children of their own which could even last for several years but all of these couples eventually decided to have children. The others had fewer children than initially wanted or planned.

Also before the availability of predictive genetic testing it has been found that the interest in prenatal diagnosis (PD) was high (two-thirds up to three quarters of

patients are interested), but most patients would not consider terminating the pregnancy if the fetus was affected (25,34). A recent study (9) reported similar results. Preimplantation genetic diagnosis (PGD) can currently be a useful alternative for these couples because it enables them to have a child not affected with the condition without having to terminate the pregnancy (35,36). Nevertheless, one of course also has to consider disadvantages such as the rather low success rate and the psychological burden of undergoing the procedure. While the interest in PGD was high in one available recent study (37), it is important to determine actual uptake because this may reveal to be much lower. Several recent studies reporting on technical developments and clinical application of PGD for FAP included only small numbers of study participants (35-36,38-40) which may be an indirect indication of the potentially low actual uptake of the procedure. More quantitative but also qualitative data will be useful to gain more insight in the factors that play a role in such a complex decision-making process.

Not only patients are confronted with difficult decisions, but also professionals are faced with dilemmas since utilization of assisted reproduction techniques for late-onset diseases still remains highly controversial among professionals (41). Recently, PGD for FAP has been a topic of discussion. In fact, in 2004 the UK Human Fertilisation and Embryology Authority (HFEA) has given permission for PGD of FAP (42). The opportunity to avoid abortion consequently to prenatal diagnosis is a very important step forward for patients. However, there is a lot of discussion whether PGD for FAP is ethically permissible and up to now it is still not performed in many centres offering PGD for other diseases (see list of PGD consortium centres offering PGD for FAP on www.eshre.com). In general, drawbacks towards utilization of PGD for hereditary cancer syndromes include the incomplete penetrance, the curability and medical management options, and the age at onset. On the one hand it has been recognized that several of these criteria are at odds in the case of FAP. Firstly, the risk to develop cancer is nearly 100%. Secondly, it has been questioned whether colectomy and lifelong screening can be considered as "real treatment". Even though colectomy can indeed prevent colon cancer, death as a consequence of duodenal carcinoma or the life-threatening complications of desmoid tumours can still occur and surgical interventions do not completely eliminate the risk of cancer. Thirdly, in case of FAP, the criterion of late age of onset as a drawback for PGD also does not hold since FAP manifests in early in life (43-45). On the other hand, additional concerns have been formulated towards the utilization of PGD for FAP such as the unknown long-term effects on the embryos selected for in-vitro fertilisation and the burden of the demand created by the implementation of available tests on "already overstretched systems" (46). There still remain many questions that need to be addressed so it has been argued that "at the current time, routine discussions by health care providers about PD and PGD are not appropriate" (47).

Family communication

To enable relatives at-risk to attend for screening at an early stage or to have genetic testing, they need to be informed about the disease running in the family. Medical specialists are not allowed to directly contact a relative at-risk and largely rely on the affected family members to pass on the information to their relatives.

Currently, little is known about family communication in FAP families. Andrews *et al*. (9) indeed showed that family members are an important source of information since the majority of study-participants reported to have used other family members to access information about FAP. Denayer *et al*. (10) reported results on information transfer about "hereditary" in FAP families. They found that transmission of information related to the genetics of FAP was problematic. Information about the mode of transmission and the 50% risk was rarely provided by family members. The content of the message was mostly very "vague" as a message "to let you be examined medically". Consequently, at-risk family members were reluctant to have regular screening.

Research in young cancer survivors indicates that informing children at a young age, prior to adolescence, provides the opportunity to incorporate to a better extent any permanent sequellae into their self-concept, while the confrontation with (a risk for) a chronic or life-threatening disease during puberty is more likely to interfere with self-esteem (48). It has been found that many parents considered the age of 10 years or older the most suitable age to inform children about polyposis (9,25) but it remains unclear whether, when, or how parents actually inform their children about the risk of FAP and the disease in the family. Withholding important medical information can have negative effects on the parent-children relationship for many reasons. For children it can increase anxiety since family secrets can be anxiety inducing. For the parents however, there is evidence that it also adds to a poorer psychological functioning (49).

Conclusions

For clinical practice, it is very important to have more research data on how FAP patients at different ages cope with the disease, on the impact of genetic testing, on reproductive decision-making and on family communication. Findings described above were obtained from only a few studies which were often conducted using specific study groups (e.g. before the availability of genetic testing, young adults, patient with desmoid tumours) or which were using a mixed group of study participants (e.g. patients and at-risk relatives or a combination of patients with FAP or MEN2a) and several of these studies originated from the 90ties. Furthermore, most studies were cross-sectional in nature and there is

an urgent need for more prospective data. Therefore, results reported here need to be confirmed by additional research and new themes need to be explored. It seems particularly useful to know more about how minors live with the disease, the treatment and its consequences since the above studies almost all included adults.

The rarity of FAP makes it difficult for any single clinical unit to develop experience with the wide range of potentially relevant issues related to this disease. Multi-centre studies are necessary in order to obtain valid scientific data. Polyposis registries can play a major role here since they centralize data on a regional or national level. Polyposis registries have already proven to be very useful to decrease the prevalence of colorectal cancer and to improve prognosis (50). The Belgian Polyposis Registry aims at preventing cancer and at enhancing quality of life by 1) providing information about polyposis to patients and relatives, 2) supporting physicians to trace families and to guarantee regular screening and follow-up for their patients, 3) participating in research on the basis of a registry and 4) stimulating informal contacts between patients creating an opportunity to exchange experiences and to enhance social support. It hereby wants to contribute not only to the medical benefit of patients but also to the psychosocial well being of FAP patients and their family.

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