Peculiarities of the Inner Maternal Position of Young Child with Down Syndrome

Svetlana Eugenevna Inevatkina¹

¹ Mordovian State Pedagogical Institute named after M.E. Evseviev, Mordovia, Russia

Correspondence: Svetlana Eugenevna Inevatkina, Mordovian State Pedagogical Institute named after M.E. Evseviev, Saransk, Studencheskaya str., 11 a., Mordovia 430007, Russia.

Received: November 5, 2014Accepted: December 5, 2014Online Published: March 29, 2015doi:10.5539/ies.v8n4p143URL: http://dx.doi.org/10.5539/ies.v8n4p143

Abstract

The article studies the dominant role of the child-mother relationships in the development and formation of personality of the infants and young children with Down syndrome. The article contains the information about the distortion of the child-mother relationships which leads to the different disorders of the mental development of a child. The article describes the construct of "inner maternal position". It contains the methods and results of investigation aimed at revealing and study of peculiarities of the inner maternal position. It also describes the possible targets of psychological and pedagogical aid depending on the variant of the inner maternal position.

Keywords: child-parents relationships, parent attitude, parents' positions, inner maternal position, mental development of a child, infant, young child, children with Down syndrome

1. Introduction

Modern psychological and pedagogical literature often contains the opinion about the importance of child-parents relationships quality and about its crucial role in the development and personality formation of Down syndrome infants and young children. A lot of investigators point out that the basis for the development of all types of activity of a Down syndrome infant and young child as well as his/her relationships with the world is his/her interrelations with a mother or other important adult, and the distortion of child-parents relationships leads to the emotional and behavioural problems, mental, motor, psychological and psychosomatic development disorders (Ainswort & Bowlby, 1991; Bern, 2010; Winnicott, 2004; Vygotskiy, 2006; Leontiev, 2005; Lisina, 2009).

In psychological and pedagogic literature there is an opinion about the fact that the basis of parents' behaviour in interrelation with a child is some psychological formation which determines its peculiarities. Terms and definitions which describe this psychological formation as well as notion about its content, structure and dynamics depend on theoretical orientations of the authors, The works by A. S. Spivakovskaya can tell us about the "parental position" (Spivakovskaya, 1989), Aivazyan (2008) and Zakharova (1997) speaks of the inner maternal position in the works of western authors the term "mother's devotion to a child" is used (Leifer, 1977; Mercer, 2004).

The analysis of the constructs which reflect the peculiarities of parental behaviour allows us to suppose that favourable change of parental concepts, attitude and behaviour lead to the change child's behaviour and response and generally changes relationships between parents and a child.

For our investigation we took "inner maternal position" (IMP) theoretic construct as a model; this construct was developed on the basis of cultural-historical approach to the psyche development. Aivazyan (2008) and Zakharova (1997) describe inner maternal position as for reflection, acceptance and applying of a new social position of a mother by a woman. The structure of the inner maternal position on the motivation level is represented by the personal meaning of the motherhood and its place in the system of current motives; on cognitive level these are the concepts of motherhood, child and relations with a child as well as the image of oneself as a mother; on the sensual level these are the emotional attitude to the motherhood, to oneself in the role of a mother and to the child. This construct allows us to totally study some phenomena which regulate maternal behaviour in child-mother relationships: personal meanings of the motherhood and their place in the system of current motives; emotional attitude to the motherhood, the oneself as a mother and to a child; image of a child,

image of oneself in the role of a mother; concepts of a child upbringing and relations with him/her.

This work is aimed at studying the peculiarities of the inner maternal position development under the conditions of upbringing of a young child with different abnormalities; experimental group comprised of mothers and their Down syndrome young children. This genetic anomaly is characterized by a high frequency in the population: among the new-born children its frequency is in average 1:600-1:900 and with mother's age more than 45 it is 1:32. Besides, this nosological group can be a model for studying the development of the inner maternal position of a mother of a child with intellectual disability since the typical characteristics of her social experience are revealing here with maximum definition.

The birth a Down syndrome child can change the whole system of mother's attitudes both in the family and beyond it. Firstly, the peculiarities of Down syndrome child development (possible somatic problems, decreased cognitive activity, weak communicative response, late development of smile and "eye-to-eye" contact etc.) can complicate interaction of a mother and a child and formation of mother's devotion (Berger & Cunningham, 1981; Emde & Brown, 1978; Emmanuel et al., 2008). Secondly, the increase of a mothers need for support can have different response of family members and relatives. Thirdly, the social attitude to the families having a child with obvious abnormalities, are often contradictory and "filled" with prejudices (Goffman, 1963; Malofeev, 2009; Nelson, 2003; Saurel-Cubizolles et al., 2007; Shukshina, Neyasova, & Serikova, 2014; Yakunchev & Gorshenina, 2013). In this regard the family's need for new social contacts increases: the communication with specialists, families having the same situation, associations and organizations which help people with abnormalities can be of great importance.

Thus, the situation of birth and upbringing of a Down syndrome child is characterized by the range of peculiarities which can be reflected both in the specific content and dynamics of the inner maternal position development and in the characteristics of a child-parents interaction. A supposition about the fact that the maternal behaviour is defined by the peculiarities of the inner maternal position can serve as a main hypothesis. In particular, we supposed that the specific nature of the inner maternal position defines the mother's behaviour within the framework of a child rehabilitation (for example, time and attention giving to the child, involvement in the process of rehabilitation etc.). Besides, the mother's behaviour can also be determined by her psychological health (Berger & Cunningham, 1983; Edge & Rogers, 2005; Emmanuel et al., 2010) or by the presence of the psychological safety of the subject (Vardanyan & Ruskina, 2013).

2. Methods

139 "mother-young child" pairs took part in the investigation, among them: experimental group–47 "mother-Down syndrome child" pairs; control group–92 "mother-normally developing child" pairs. Control and experimental groups are of the equal age and social-demographic characteristics of mothers, i.e. education, occupation for the time of investigation, marital status.

With the aim to study possible variants of the inner maternal position of women who bring up Down syndrome young children we have used the following methods: projective method "Attitude colour test (ACT)" and projective method "Unfinished sentences "Emotional-axiological attitude to the motherhood" (US EAAtM")".

Projective method attitude colour test (ACT) is aimed at revealing of the non-conscious emotional attitude to a child, oneself, motherhood and general structure of the inner maternal position. This method was developed by Etkind (1987) and modified by E. B. Aivazyan. The choice of methods is conditioned by the fact that the colour is a good indicator for the nonconscious emotional state and attitude, and the colour-associative experiment allows us to reveal deep components of the relationships, avoiding distorting and safety mechanisms of verbal system of consciousness. 9 objects were suggested for the ranging of colours: "My child now" and "My child in the future" (attitude to a child); "My family", "My husband", "Second child" (attitude to the external objects); "Me as a mother", "Me as a woman", "Me as a wife" (system of self-attitude) and "Perfect mother" (attitude to one's own concept of motherhood). For the processing, interpretation and description of data we used the technology of individual ACT data analysis.

Unfinished sentences "Emotional-axiological attitude to the motherhood" (US EAAtM") is a projective method aimed at studying of the non-conscious emotional and sense phenomena and conscious concepts, expectations in the structure of the inner maternal positions. This method was developed by E. B. Aivazyan. Process part of the method is adapted to the category of women, who were the testees in this investigation.

The method consists of 27 unfinished sentences which comprise 9 scales combined in 3 blocks:

1) Content of the meaningful sphere (scales "Meaning of life", "Meaning of a family", "Meaning of a marriage" and "Meaning of a motherhood"; 12 unfinished sentences in total);

2) Emotional-axiological attitude to a child (scales "Attitude to a child now", Expectations concerning a child in the future"; 6 unfinished sentences);

3) Emotional-axiological attitude to oneself (scales "Attitude to oneself as a mother", "Evaluation of oneself through the eyes of a husband", "Evaluation of oneself through the eyes of children"; 9 unfinished sentences).

While using this method we compare the answers, assigned to the character, which had been synthesized according to the MMPI test (controllable projection procedure, Stolina (1983)), and answers which reflects "direct" one's own position. Such comparison allows us to study both axiological orientations of the testees-values, integrated in the structure of the motivational level of the inner maternal position, and axiological ideas of the testees, which include axiological stereotypes concerning motherhood, and reflexive concepts of one's own values which with this or that degree of adequacy reflect the content of the latter one (cognitive level of the inner maternal position).

The answers of the testees were subjected to the content-analysis i.e. all the answers depending on their content were referred to this or that category (the list of categories was formed in the course of "free classification" of the acquired answers). The frequencies of the categories were processed with the help of correlation ad factor analysis.

3. Results

The analysis of the ACT results of both control and experimental group allowed us to point out four variants of the inner maternal position. The defied discontinuity of the emotional attitude which exists in the form of specific patterns of combination of positive and contradictory emotions to different aspects of situations of child upbringing, allows us to suppose the existence of the specific variants of inner conflicts behind them. In order to prove this supposition we conducted the comparison of the results of the US EAAtM projective variant between these sub-groups. The rightfulness of such comparison can be conditioned by the fact that the ACT method and projective variant of US EAAtM are addressed to the nonconscious components of the motivation level of the inner maternal position and are aimed at the indirect revealing of the motivational formations which condition the behaviour of a mother while interacting with a child. Basing on these facts the results of ACT, secondly, to extend the content interpretations of ACT data (to specify the content of inner conflicts, reveal compensation mechanisms etc.).

Let us describe the results, acquired in the course of experimental group data analysis.

The first variant of IMP (31.9 % of testees) is characterised by the positive emotional attitude to the motherhood, child and oneself. The results, acquired in the course of US EAAtM show that there are no contradictions of axiological orientations in this sub-group. One can speak of the harmony in the axiological space of the testees of this sub-group concerning the self-realisation in the role of a mother, which can be compared to the favourable condition of the emotional attitude to oneself as a mother. The content of such orientations, addressed to a child, and concepts of upbringing strategies are similar to the "normative image": orientations for the social achievements and authority, severity, control of a child. Though on this level there is another image of values concerning a child which corrected with the account to his/her peculiarities and abilities (the focus of significance is moved from the social well-being of a child to his/her internal well-being). The differences between the content of emotional-axiological and declared levels of a child image is probably conditioned by the safety mechanisms which allow solving the contradictions between the desired image and the real abilities of a child and preserving positive emotional attitude to him/her and favourable emotional background for the account of denial to see and consider peculiarities of the development and prospects of a child.

The second variant of IMP (38.3% of testees) is characterised by the general ambivalent attitude to the motherhood, child and oneself. In the results of ACT data this variant is reflected in the fact that for the first four positions the rows of colour which are associated with the most of objects, in particular with such as "Me as a mother", "Child now", "Child in the future", there are such colours as grey, brown and/or black and their combinations. In the structure of the second variant of the inner maternal position the ambivalent attitude to the role of a mother, revealed from the results of ACT, correlates with the conflict between the significant goals and abilities of their implementation: goals for self-realization in the leading and professional role are felt as inaccessible or inappropriate. The solving of this conflict perhaps is projected to the future, but in the present the ability of self-realisation is connected with the special role of a "teacher" or "tutor" which is filled with concepts of equal and democratic relationships with a child.

The results, acquired with the help of US EAAtM method, showed that the axiological expectations, addressed to

the child, are characterised by some contradictions: on both levels of the image of a child the values of his/her inner well-being are opposed to the social achievements, and the Down syndrome is taken into account and not accepted in the same time. Unlike the first subgroup i which the contradiction between the "normative" values and reality is solved for the account of differentiation of emotional-meaningful and declared levels, in this group the conflict is not solved. Obviously, this is the source of ambivalent feelings in the emotional attitude to the child.

The third variant of IMP (23.4 % of testees) is characterised by ambivalent attitude to the motherhood on the background of positive attitude to a child. In the results of ACT this variant is reflected i the fact that on the first four positions of the colour raw which is associated with the object "Mother" there are grey, brown and/or black colours and their combinations, and on the first four positions of the colour raw which is associated with the object "Child" there are mainly colours in combination with violate. In this case the specific nature of the maternal role is characterised by the fact that the motherhood is perceived as an effort-taking activity. A person poses strict demands to oneself, these are specific and contradictory demands which include both "leader" and "mother" qualities. On the declared level the contradictions are resolved by means of decrease of "leader" qualities and increase of the "mother" characteristics' significance. Being a means of self-realization and self-affirmation, the maternal role does not find any joy in the attitude to a child, and love is filled with specific meanings - compassion, care and dedication. Only on the declared level the testees of this group speak of the joy in the attitude to a child, trying to correspond to the image of the perfect mother.

Axiological expectations addressed to a child are characterised by the decrease of the axiological status of the child's quality which are difficult to achieve due to Down syndrome (health, intellect, resemblance to the agemates, Down syndrome) and increase of the value of quality, which are real to be achieved by their child (personal well-being, independence, kindness). In this variant of the inner maternal position one can find the signs of total acceptance and readiness to accept a child "as it is". The absence of contradictions in the content of the child image is shown in the positive emotional attitude to a child.

The fourth variant of IMP (6.4 % of testees) is characterised by ambivalent attitude to the motherhood on the background of positive acceptance of the role of a mother. In the results of ACT this variant is reflected i the fact that on the first four positions of the colour raw which is associated with the object "Mother" there are main colours in combination with violate; on the first four positions of the colour raw which is associated with the object "Mother" there are main colours in combination with violate; on the first four positions of the colour raw which is associated with the object "Child" there are grey, brown and/or black and their combinations. While analysing the results the data acquired from the fourth variant of ACT were not taken into account since that sub-group is represented by three testees. The fourth variant of the emotional attitude "Ambivalent attitude to a child on the background of emotional acceptance of a mother role" is revealed for three persons. Due to this fact the results, acquired from this sub-group using the US EAAtM method, could not be included into the statistic analysis and could not be interpreted properly.

We perform an additional interview of mothers of Down syndrome children and specialists who work with "mother-Down syndrome child" pairs. The aim of the interview was the gathering of the follow-up data concerning the peculiarities of the mental development of a child, self-realisation of a mother in the profession of other spheres, participation of a mother in treatment, rehabilitation and development measures and its attitude to them.

The data analysis, performed in the work of Inevatkina (2011) showed that the third variant of the inner maternal position is the most favourable variant of IMP from the viewpoint of conditions for child development, since there is an active participation in rehabilitation of a child and positive contact while interacting. That means that the testees of the mentioned sub-group gladly spend a lot of time with their children. The mothers proudly speak of their children, they are happy with children's everyday successes and achievements, the problems are presented as tasks which are to be solved. The women of this sub-group are oriented to the developing potential of the measures performed for the child. That's why they take very seriously the issue of finding out the centre of development of a child and specialists, they visit, as a rule, several centres, take additional exercises, work with private specialists, use recommendations from the centre for in-home exercises. The attendance of a kindergarten is considered as a possibility of his/her development, that's why pre-school institutions are selected very carefully. Besides, while interacting with a child they stimulate and support the dialogue with him/her. The game is organised as a sequential (mother-child-mother-child) performance of some actions (feeding, combing, building), the benefit is derived from any game situation; the offered games and activities are variable. The mother reacts with the help of expressions, touching, stroke, tapping to all the initiatives of a child, comments his/her state, mood, actions. The vocalization of a child, his gestures, game actions are "reflected" by the mother and taken as a response while talking with him/her. Everything seen by a child (toys, objects) is commented by the mother, she names these objects and asks the child to name it too. All the comments and expressions used by the mother while communicating are addressed to the child. While interacting the child doesn't get any negative evaluation, the mother constantly creates a situation of success for him.

The first variant of the inner maternal position is characterised by the fact that the mother actively participates in the rehabilitation of her child, but the interaction can be characterised by both positive and negative contact. Due to this fact the first variant of IMP can be considered as a risk factor for distortion of the mother's behaviour in the interaction with a child which can be connected to the under-assessment of the child's abilities and his/her specific needs.

The second variant of inner maternal position can be characterised by different mothers' participation in child's rehabilitation, but the contact is as a rule negative. That means that mothers often ignore the signals, sent by a child and his/her initiatives, they do not support the dialogue with the child, there is no game-dialogue. In case when a child loses the interest to a game or a toy, the mother experiences difficulties in offering another activity, selecting of available games for a child; for example, she doesn't pay attention to the motor uneasiness of the baby etc. Having conversation or commenting some actions the testees do it for the other adult but not for the child. The attention is not paid to the means communication available for the child, the mother doesn't take them as the answer and does not "reflect" them. Often the mother does not take part in the game of a child or in other his/her activities, does not name things and phenomena which are taking place during the game, without a word she observes the actions performed by a child for example with a toy. While performing subjective actions or pronouncing syllables and words by a child the mother wants it to be qualitative, otherwise the child will get negative assessment which contributes to the formation of unsuccessful situation for the child.

The presence of the second inner maternal position is a factor which determines the necessity of the psychological and psycho-correctional aid for the mother.

Psychological-pedagogic work with "mother-Down syndrome child" dyad should be differentiated since the mothers with different variants of the inner maternal position have different problem zones.

4. Discussion

The acquired results allow us to make the following suppositions about the possible targets of the psychological-pedagogic aid for the mothers having Down syndrome young child. The first variant of the inner maternal position refer the mothers to the rest group according to the interaction quality. The specialists should focus the mother's attention on the "special" development of her child even if this will decompensate her emotional state, in order to form the demand for pedagogic support. During the psychological-pedagogic correction the interaction between a mother and a Down syndrome young child it is necessary to find special forms of teaching interaction, which aims are to be the increase if mother's sensuality to the reactions of her child. It is necessary to develop effective methods of mothers' teaching support and correct reaction to all the initiatives and signals of the child.

The existence of the second variant of the inner maternal position is the factor which determines the necessity of psychological and psycho-correctional aid addressed to a mother; the main specialist who leads the family on the first stage in the early aid service should be the psychologist. The use of a teacher and the beginning of the correction lessons with a child on the first stage of the family work in the early aid service can have little effect since it can cause the transfer of the responsibility for the development of a child to the specialists, as well as mother's concentration on the formal achievement of normal values of development.

From the point of view of the child-centred ideology the third variant of the inner maternal position is the most favourable. On the one hand it is characterised by the high standards to oneself, it is the source of stress and anxiety, and on the other hand this maternal position is the main one for the model of a "good mother" for the child with special needs. There is no doubt that the structure of such inner maternal position has its problem zones, and the life of such mothers is full of difficult moments and emotions. But in this case we can speak of such resources as high and consistent parental motivation, reflection of one's own actions, desire to improve oneself in the upbringing and development of a child. Due to these facts the psychological help for such mothers can be rendered on request, and in some cases the pedagogic support can be enough. Moreover, the resources of the representatives of this sub-group can be used in work with other families with similar situations. On can suppose that the social activity and the ability to help other families having similar situations, can be a significant contribution to their own self-realization.

5. Report

Due to the fact that the main factor of an infant and a young child development is the interaction in

"mother-child" pair. Within the framework of formation and development of the early aid system for families having Down syndrome children it necessary to have a brand new methodological approach which needs reviewing of the aid object. The object of the early aid in the special formation is the interaction of mother and child, dyad "mother-child with abnormalities" and more–"family having disabled child". Respectively, the subject of investigation in the special pedagogic and psychology is also changed. Now it is an interaction of a mother and a child as well as factors which condition its peculiarities, in particular, psychological peculiarities of a mother which control her behaviour while interacting.

The acquired results first of all show four variants of inner maternal position in the situation of upbringing Down syndrome infant or young child. The results of the investigation show that the mothers with different variants of the inner maternal position have different problem zones, different resources and different forecast respectively. So the work with these women should use different content, methods and strategies of specialists' influence. Basing on the above said the prospects of the further development of scientific problem can be in projecting and experimental probation of methods and techniques of psychological help for families having Down syndrome child as well as in development of methods and techniques of psychological-pedagogic correction of interaction in "mother-Down syndrome child" pair.

Acknowledgements

The article is prepared with financial support from the Ministry of Education and Science of the Russian Federation using the funds of the project 2.1.2. "The solving of the complex problems of a teacher or psychologist competence professional formation in the system of continuous education" of the programme of strategic development of FSBEI HPO "Mordovian State Pedagogic University named after M.E. Evseviev" for 2012-2016.

References

Ainswort, M., & Bowlby, J. (1991). An ethological approach to personality. Amer. Psychol., 46(4), 331-341.

- Aivazyan, E. B., & Arina, G. A. (2008). Establishing of the inner maternal position during pregnancy. *Defectology*, 2, 8-15.
- Berger, J., & Cunningham, C. (1981). Development of eye contact between mothers and normal versus Down syndrome infants. *Developmental psychology*, 17, 678-689. http://dx.doi.org/10.1037/0012-1649.17.5.678
- Berger, J., & Cunningham, C. (1983). Development of early vocal behaviors and interactions in Down's syndrom and non-handicapped infant-mother pairs. *Development psychology*, *19*, 322-331. http://dx.doi.org/10.1037/0012-1649.19.3.322
- Bern, E. (2010). Games which people play. Moscow: Eksmo.
- Edge, D., & Rogers, A. (2005). Dealing with it: Black Caribbean women's response to adversity and psychological distress associated with pregnancy, childbirth, and early motherhood. Social Science and Medicine, 61(1), 15-25. http://dx.doi.org/10.1016/j.socscimed.2004.11.047
- Emde, R. N., & Brown, C. (1978). Adaptation to the birth of Down syndrome infants. *Journal of American academy for child psychiatry*, *17*, 299-323. http://dx.doi.org/10.1016/S0002-7138(10)60094-5
- Emmanuel, E., & St John, W. (2010). Maternal distress: A concept analysis. *Journal of Advanced Nursing*, 66(7), 2104-2115. http://dx.doi.org/10.1111/j.1365-2648.2010.05371.x
- Emmanuel, E., Creedy, D. K., St John, W., Gamble, J., & Brown, C. (2008). Maternal role development following childbirth among Australian women. *Journal of Advanced Nursing*, 64(1), 18-26. http://dx.doi.org/10.1111/j.1365-2648.2008.04757.x
- Etkind, A. M. (1987). Attitude colour test. General psychodiagnostics. Moscow.
- Goffman, E. (1963). Stigma: Notes on the management of spoiled identity. Englewood Cliffs, NJ: Prentice Hall.
- Inevatkina, S. E. (2011). Peculiarities of interrelation of a mother and a disabled child. Art sciences and education, 1, 44-47.
- Leifer, M. (1977). Psychological changes accompanying pregnancy and motherhood. *Genetic Psychology Monograph*, 95, 55-96.
- Leontyev, A. N. (2005). Activity. Conscious. Personality. Moscow: Sense Academy.
- Lisina, M. I. (2009). Formation of the child personality in communication. St. Petersburg: PITER "Psychology masters".

- Malofeev, N. N. (2009). Special education in the changing world. Europe: Educational medium for the students of pedagogic higher educational establishments. Moscow: Prosveshchenie.
- Mercer, R. (2004). Becoming a mother versus maternal role attainment. *Journal of Nursing Scholarship*, *36*(3), 226-232. http://dx.doi.org/10.1111/j.1547-5069.2004.04042.x
- Nelson, A. (2003). Transition to motherhood. *Journal of Obstetric Gynaecology and Neonatal Nursing*, 32, 465-477. http://dx.doi.org/10.1177/0884217503255199
- Saurel-Cubizolles, M. J., Romito, P., & Lelong, N. (2007). Women's psychological health according to their maternal status: A study in France. *Journal of Psychosomatic Obstetrics and Gynecology*, 28(4), 243-249. http://dx.doi.org/10.1080/01674820701350351
- Shukshina, T. I., Neyasova, I. A., & Serikova, L. A. (2014). Diagnosis of the level of assimilation of the social experience by younger schoolchildren. *Life Science Journal*, *12*(12), 371-374.
- Spivakovskaya, A. S. (1989). *Psychological aid for the families which adopted children form governmental institutions*. Peculiarities of personality development of a child having no parental guardianship. Children with abnormal behaviour. Moscow: Prometey.
- Stolin, V. V. (1983). Self-conscious of personality. Moscow: Publishing house of MSU.
- Vardanyan, Y. V., & Ruskina, E. N. (2013). The Research of Coach's Preparation to Realization of Strategies of Formation of Psychological Safety of the Subject of Sports Activity. *Middle-East Journal of Scientific Research*, 14(7), 965-968.
- Vygotskiy, L. S. (2006). Questions of child psychology. St. Petersburg: SOYUZ.
- Winnicott, D. V. (2004). Family and personality development of a child. Mother and a child. Ekaterinburg: Litur.
- Yakunchev, M. A., & Gorshenina, S. N. (2013). Diagnostics of Ethno-Cultural Competence of the Future Teachers. *Middle East Journal of Scientific Research*, 16(12), 1709-1713.
- Zakharova, E. I. (1997). Questionnaire for the investigation of the emotional component of parent-child interrelations. *Family psychology and family therapy*, *1*, 67-76.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (http://creativecommons.org/licenses/by/3.0/).